FEBRUARY 9, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

*MARKET RESEARCH

Are you making the best use of this management tool? Frank P. Minnelli shows how it helps Yale & Towne's Philadelphia Division—page 70

✔ METAL INVENTORIES IMPROVE
Survey Reveals Better Balance, p. 59

✔ MAINTAINING TOOL STEEL QUALITY
Precise Checks Are Required, p. 102

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take a **CLOSER LOOK** at

B&W TUBING for AIRCRAFT

STRUCTURAL ASSEMBLIES
MECHANICAL PARTS
ENGINE COMPONENTS

Designers and manufacturers of aircraft and component parts can choose B&W Seamless and Welded Steel Tubing with assurance of getting the properties and characteristics required in their finished products . . . and the best combination for utmost ease and economy of fabrication. Critical requirements of high structural strength-to-weight ratio; high and low temperature strength; and resistance to corrosion, stress, fatigue, wear, and shock are all met by B&W Tubing in strict conformity to aircraft standards. Consistently uniform properties and workability are "built" into every foot of B&W Tubing because it is made by closely-controlled precision methods that hold quality to the high standards needed by the industry. Be sure Mr. Tubes —your B&W Tube Representative—is on *your* list to consult on *all* problems involving the wide variety of tubing in the accompanying column.

Keep your materials information file up-to-date by requesting a copy of new Bulletin TB-537—"B&W Tubing for the Aircraft Industry".

TYPES
Seamless and welded

SHAPES
Round, square, rectangular, or other forms

GRADES
Stainless Steels—austenitic and ferritic types, B&W Cralovs 12 to 27
SAE AISI Alloys, and Nittalloy Steels
Carbon Steels—in various grades

SIZES
Up to 9⅝ inches outside diameter in a wide range of wall thicknesses

SURFACE FINISHES
As rolled, as drawn, as welded, flash removed, turned, scale free, and polished

SPECIFICATIONS
AMS, MIL, ASTM, U.S. Government, and as determined by individual requirements

QUALITY
Open hearth and electric furnace steels, including aircraft and magnaflux quality

CONDITION
Unannealed, annealed, tempered, normalized, or otherwise heat treated as required

FABRICATION
Upsetting, swaging, expanding, bending, safe-ending, and machining

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
General Offices & Plants
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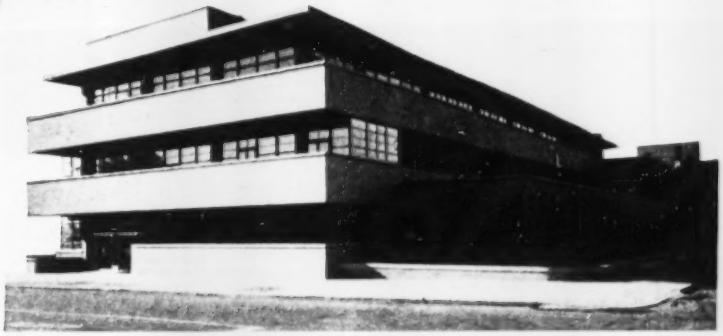
B&W SEAMLESS and WELDED TUBES

TA-1684-(C)

Robinson's Beverly

A beautiful addition to the Beverly Hills shopping district on glittering Wilshire Boulevard. The structural steel was fabricated and erected by Bethlehem Pacific. Paul E. Jeffers handled the structural engineering. William Simpson Construction Company was the general contractor.

Distinctive California Architecture with Steelwork by BETHLEHEM PACIFIC

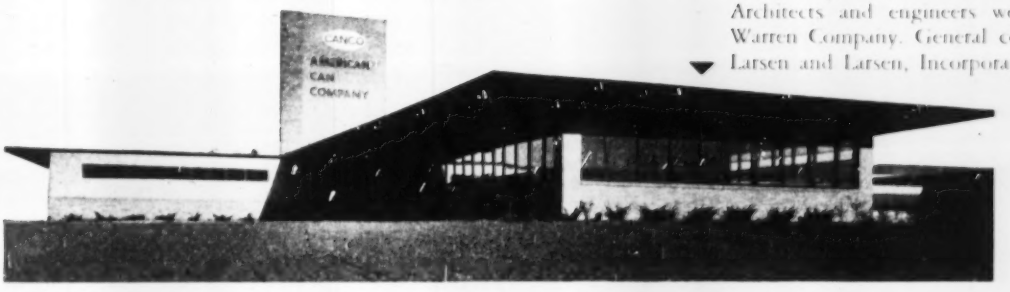


Sacramento Bee's Plant Building

Editorial offices, business offices, and press rooms for the McClatchy newspaper in California's capital city. Bethlehem Pacific handled the steel construction. Architects and engineers were Lockwood-Greene Engineers, Inc. General contractors were Lawrence Construction Co., and H. W. Robertson, Inc.

American Can's Stockton Plant

Steelwork for the office building, manufacturing building, and warehouse at this modern container plant was a Bethlehem Pacific job. Architects and engineers were Donald R. Warren Company. General contractors were Larsen and Larsen, Incorporated.



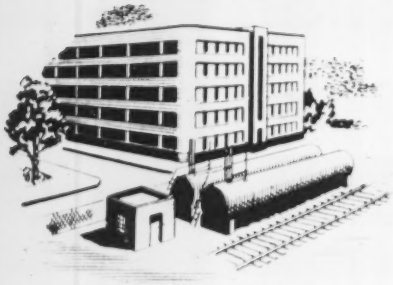
BETHLEHEM PACIFIC COAST STEEL CORPORATION, *General Offices: San Francisco*

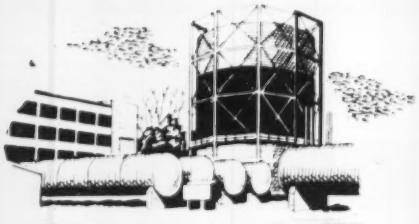
BETHLEHEM STEEL

America's Largest Selling Brand of LP-Gas

PHILGAS*!

CLEAN, UNIFORM HEAT FOR INDUSTRIES *AND* UTILITIES





PHILGAS BENEFITS: This top-quality Phillips *66* butane-propane fuel is uniform in thermal value and gravity. Free from harmful contaminants, it burns *clean!* Automatic operation cuts down on overhead, assures constant furnace temperatures, atmospheres and pressures.

PHILGAS USES: Leading industries use Philgas successfully for heat treating, mold drying, core baking, ceramic firing and many other operations. Many progressive utilities also find it advantageous to augment their natural or manufactured gas output with clean-burning, reliable Philgas.

*Philgas is the Phillips Petroleum Company trademark for its high quality propane-butane LP-Gas or bottled gas

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RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

B. F. GOODRICH GROMMET V BELT

Where failures meant shutdowns they changed to grommet belts

B. F. Goodrich grommet V belts last 20 to 50% longer

Crushing rock puts terrific shock loads on the V belts that drive the crusher. When the drive stops because of premature belt failure, the whole operation shuts down, deliveries are delayed. The stone company wanted reliability—and got it—when a set of B. F. Goodrich grommet V belts was installed. In spite of the shaking, jolting action, the grommet V belts on this crusher have already given two years of trouble-free service, and are still in excellent condition. Here's why B. F. Goodrich grommet V belts outlast and outperform ordinary belts.

No cord ends

A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

Concentrated cord strength

All of the cord material in a B. F. Goodrich grommet belt is *concentrated* in twin grommets, positioned close to the driving faces of the pulley. There are no layers of cords to rub against one another and generate heat, cord and adhesion failures are reduced. And grommet V belts stretch less—only ½ as much, on an average, as ordinary V belts.

Better grip, less slip

Grommet V belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ½ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

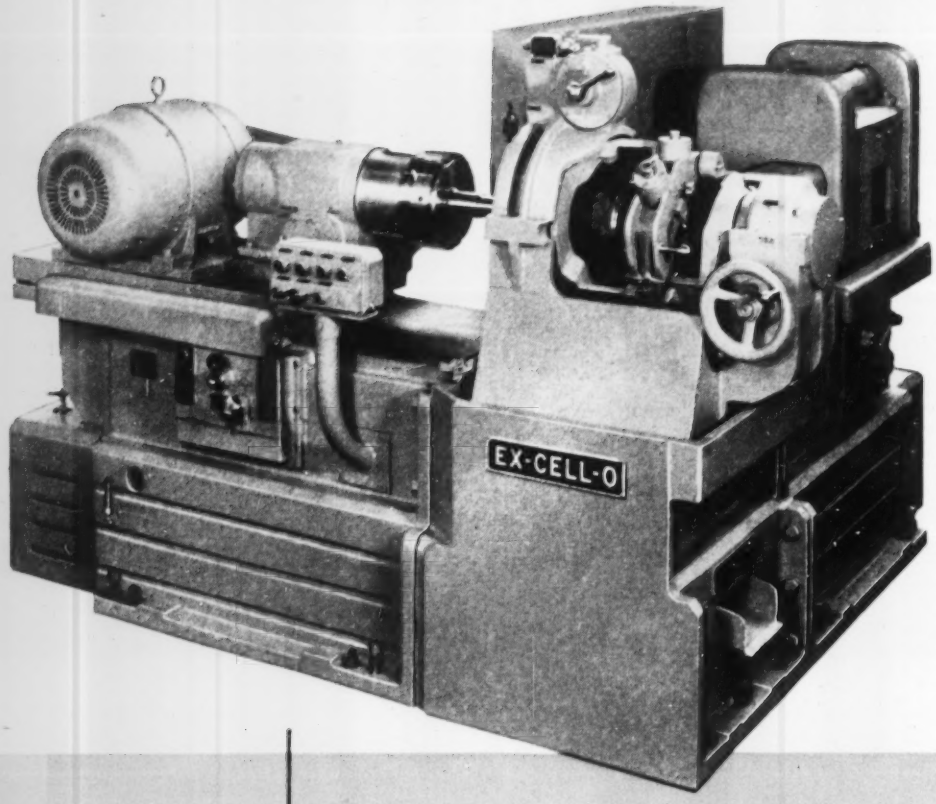
They cost no more

Grommet V belts cut costs because they last longer, increase production because machines keep running with fewer interruptions, reduce maintenance costs because they need less attention, yet they cost not one cent more. Available in C, D and E sections. But remember, only B. F. Goodrich makes the grommet V belt (U. S. Patent No. 2,255,294), so to get all these savings, call in your local BFG distributor the next time you need V belts, or write *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.* (Available in Canada.)

Grommet V-Belts BY

B.F.Goodrich

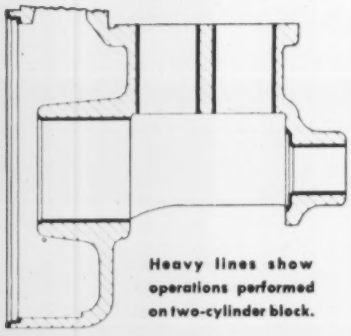
RUBBER FOR INDUSTRY



Ex-Cell-O Two-Way Precision Boring Machine, with fixture that accommodates two- and three-cylinder in-line refrigerator compressor blocks; four- and six-cylinder V-type blocks.

XLO
EX-CELL-O *for* PRECISION

EX-CELL-O WAY MACHINE BORES CYLINDERS AND CRANK BEARINGS SIMULTANEOUSLY



Heavy lines show operations performed on two-cylinder block.

ACCURACY OF 90° ANGLE IS BUILT INTO MACHINE

This Ex-Cell-O Way Machine precision bores cylinders and crankshaft bearings of refrigerator compressor bodies, holding a 90° angle between the bores within .001″ in 14″. When operations from two directions are performed on one machine the possibility of error in relocating and reclamping the part for each operation is eliminated. Thus the accurate relationship of one operation to another is built into the machine. And of course, doing the operations simultaneously saves time and money too.

Ex-Cell-O Way Type Precision Boring Machines are built up by combining standard way units with a center section and adding tooling to fit the job. Standard way units are economical, self-contained, and can be used over and over again in different combinations. For full information, contact your local Ex-Cell-O representative, or write Ex-Cell-O in Detroit today.

EX-CELL-O

CORPORATION
DETROIT 32, MICHIGAN

51-2

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

This Week in Metalworking

STEEL

Vol. 132 No. 6 Feb. 9, 1953

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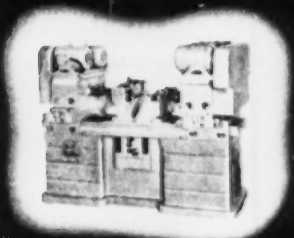
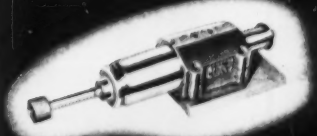
XLO
EX-CELL-O for PRECISION

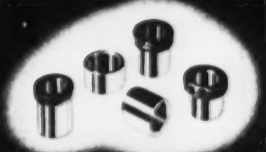


PRECISION MACHINE TOOLS

CONTINENTAL CUTTING TOOLS

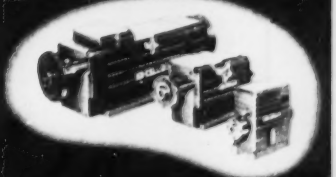


PRECISION GRINDING SPINDLES



DRILL JIG BUSHINGS

AIRCRAFT AND PRECISION PARTS



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51-18

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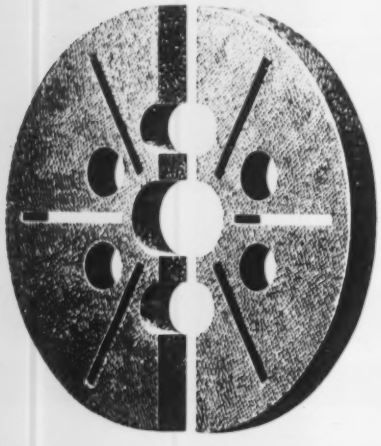

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Behind the Scenes . . .

Never Let Him Go

Our cover story this week is about Frank P. (for Pickett) Minnelli, market research manager of Yale & Towne Mfg. Co.'s Philadelphia Division, which makes a variety of materials handling equipment. His activities are described to give you an idea of the part market research plays in management planning.

In putting together this type of story an editor follows the subject through a typical day in his business life, gathering information on his work and how he meets his problems, photographing the subject in action during the day. Photos of Mr. Minnelli were made for STEEL by Roy Duffus. Among the photographs received by the editors upstairs was the above; the editor assigned to the story baldly explains he didn't let the subject out of his sight for a minute. Scuttlebutt around the Yale plant, he informs us, is that executive employees aren't fired they're stripped of their Mens' Room key.

Mr. Minnelli, we are informed, is possessed of a cheerful disposition, quick smile and keen humor, in addition to being a crackerjack researcher. An ex-Elmo Roper organization executive, Mr. Minnelli once lived in New York City, where for several years he was subjected daily to the vagaries of the Long Island Railroad, notorious for its casual disregard of schedules. With humor born of exasperation, Frank Minnelli would send a note of thanks to the road's president each day his train was on time.

Recognized by his associates as a true gourmet, Frank Minnelli is an avid and accomplished chef. A story circulated about the Yale plant concerns a demonstration of his prowess at charcoal-broiling steaks. A friend was quite impressed with the finesse with which he dipped a small brush in a jar of water and flicked it over the coals to maintain uniform heat under the steak. Several weeks later the friend tried to dazzle his dinner guests with the same technique, using a paint brush. Result: He completely extinguished the fire, leaving a soggy mass of steaming coals and raw meat.

Lost Art

Speaking before the annual meeting of the ASME, and explaining the developments of automation, George M. Muschamp, vice president of engineering, Industrial Division, Minneapolis-Honeywell Regulator Co., cited the example of a modern high-speed rolling mill turning out strip steel at 5000 fpm. "I have calculated", he continued, "that it would take 50,000 blacksmiths to attain a like production with hammers."

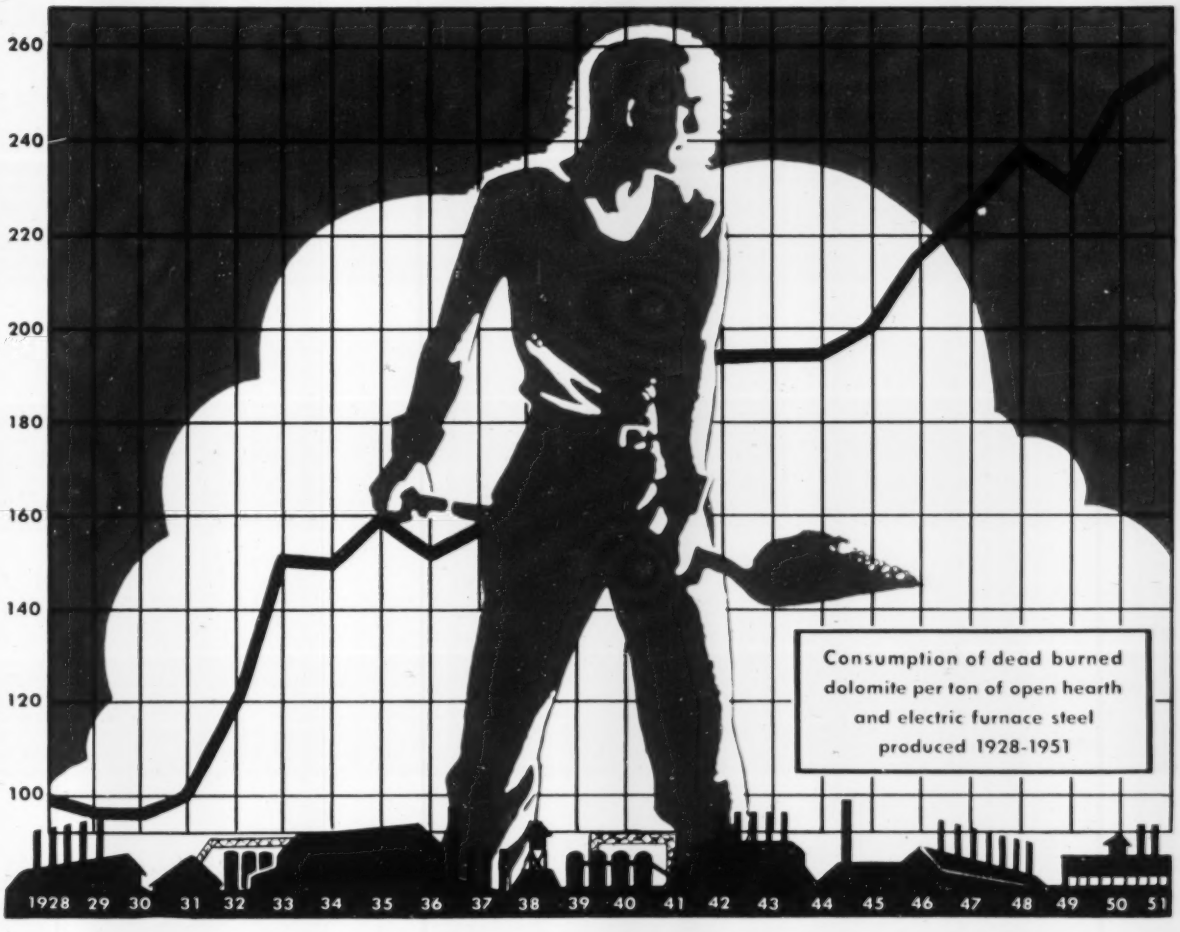
It would be kind of hard to find that many, wouldn't it, Mr. M?

Keep 'Em Coming!

Golly, we appreciate your coming to our rescue and sending in the January 5 Metalworking Yearbook issues, the supply of which was completely depleted with the rush of new subscriptions over the last few weeks. Our offer still stands: We'll pay $2.00 for every one returned in reasonably good condition but don't, for gosh sakes, spend $1.56 in postage like one of our good pals out in Kansas City. It shouldn't run you over 30c or so.

Shradu

(Metalworking Outlook—Page 51)



why the swing to dead burned dolomite?

THE use of dead burned dolomite by the steel industry has more than doubled in the past 21 years. Consumption per ton of steel is now a third higher than during the war. This steadily rising trend is due to three factors:

1. It saves time. Operation of steel furnaces at near capacity rates demands a repair material that "sets fast and stays fast". Normal maintenance with dead burned dolomite takes no more time than is required to place the refractory.

2. It reduces bottom delays. The deteriorating quality of charge materials, fluxes and fuels contributes to increased severity of bank and bottom trouble. Proper use of dead burned dolomite makes it possible to offset the adverse effects of these factors and keep bottom delay down.

3. It lowers refractory costs. Despite the continuing trend toward the use of more dead burned dolomite, many shops report a reduction in total maintenance refractory expenditures, with consequently lower refractory cost per ton of steel made.

Dead burned dolomite is now in free supply. Steel producers who have been dependent on other fettling materials can now take advantage of the economies of a dead burned dolomite practice. Present users, too, may benefit from a more liberal use of this low-cost refractory.

With the completion of its third major dead burned dolomite expansion in the last ten years, Basic Refractories is prepared adequately to serve the needs of the steel industry with Magnefer and Syndolag.

GRANULAR BASIC REFRACTORIES

Basic Refractories Incorporated

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Write for free booklet "Underlying Steel". This graphic booklet tells the story in words and pictures of granular basic refractories and their role in the production of open hearth steel. Address Dept. 16.

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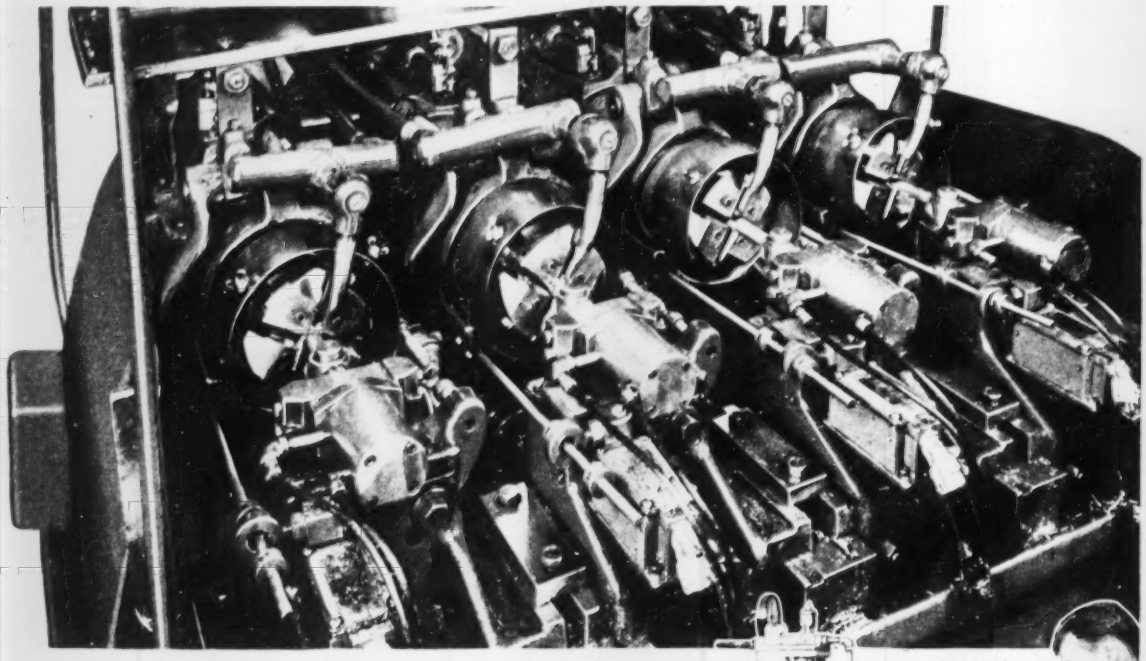
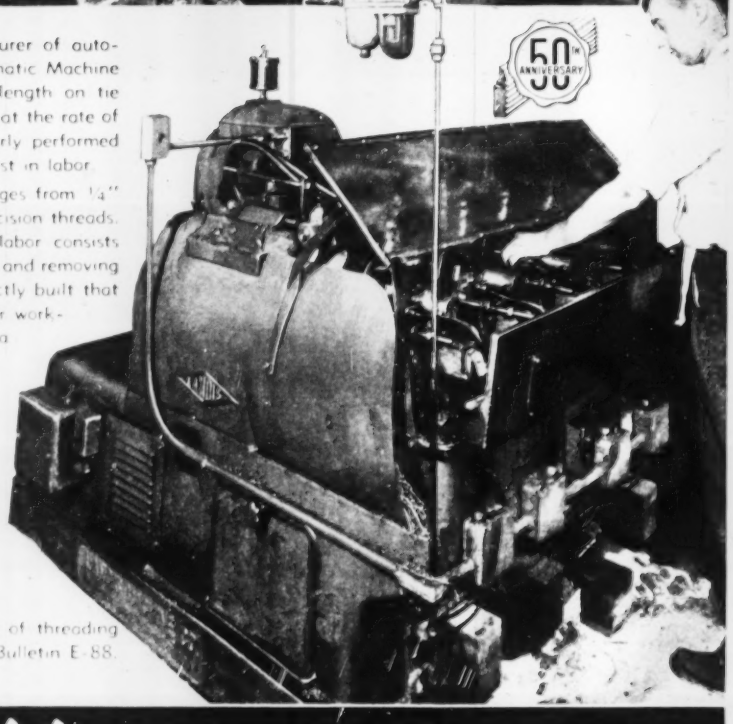


Illustrated in the plant of a large manufacturer of automobile parts is a LANDIS 4 Spindle Semi-Automatic Machine mass producing 7/16" 18-P threads 2¼" in length on tie rod sockets. The threads are cut to a Class 3 fit at the rate of 520 pieces per hour. This operation was formerly performed on a double-spindle machine — at twice the cost in labor.

This machine, whose diametrical capacity ranges from ¼" to 1", is designed for the mass-production of precision threads. During the operation illustrated here, manual labor consists merely of placing the blanks on work-holding pins and removing them when threaded. The machine is so compactly built that one operator can easily reach any one of the four work-loading stations from a fixed central position — a feature which enables one man to do the work of two with minimum operating fatigue.

Through the combined output of four die heads, high production is obtained at comparatively low spindle speeds. This feature not only results in finer thread finish, but also greatly extends chaser life, thus effecting a sharp reduction in tool cost. Other advantages inherent in the LANDIS 4 Spindle Semi-Automatic Machine include: quick set-up, thread concentricity, elimination of side-shave, and adaptability to a wide range of threading operations. For complete information, write for Bulletin E-88.



LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA

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... the answer to most of your indoor rust prevention problems

LOOK!

All these advantages are combined in ONE multi-purpose rust preventive!

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- ✓ **THIN FILM** — *(average .0003")—practically colorless*
- ✓ **LOW COST COVERAGE** — *over 1300 sq. ft. per gallon*

We believe no other rust preventive possesses all of the properties combined in Rust Veto 377.

This modern, thin-film polar type preventive withstands severe humidity tests and is a "natural" for indoor uses. It exceeds 24 hour 20% salt spray test.

It deposits a thin, tough film which clings to parts but is easily removable.

For indoor storage you can't do better than to use Rust Veto 377. Get latest bulletin from your Houghton Man or write to E. F. Houghton & Co., Phila. 33, Pa.

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. . . right in your own plant how your production and your products can be improved with this modern fastening method. Your design and production men can actually participate and test the results on your own products.

For full information on Nelweld as applied to steel fabrication, write the Main Office, Lorain, Ohio.

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NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

LETTERS
TO THE EDITORS

I am very much impressed with your article "Here's How To Untangle Metal Specifications" on pp. 80-86, Jan. 19 issue of STEEL. I would appreciate if you could send me by return mail a copy of the latest cross index described in that article.

C. F. Friedy
development engineer, Sales Division
Armco Steel Corp.
Middletown, O.

Once in a while something comes along which looks especially good. Your Specifications Handbook is such an item.

J. M. Williams
metallurgist
General Plate Division
Metal & Controls Corp.
Attleboro, Mass.

We note in your current issue of STEEL, the special offer on the new Specifications Handbook, which we would like to have in our possession. We have been a subscriber to STEEL for the past 25 years . . .

H. F. Baumgartner
assistant purchasing agent
Lehigh Structural Steel Co.
Allentown, Pa.

It might be of interest to you that I was a subscriber to your periodical when it was the Iron Trade Review, over 25 years ago, and continued to subscribe when it was changed to STEEL. I have found it to be very interesting and satisfying both from a statistical and technical standpoint.

I am interested in the Specifications Handbook and would like to have a copy . . .

H. M. Brightman
chief engineer
Columbia Steel & Shafting Co.
Pittsburgh

Both our manufacturing department and purchasing department would like a copy of STEEL's Specifications Handbook . . .

John F. Morten
manager, Adv. & Sales Promotion
Sturtevant Division
Westinghouse Electric Corp.
Boston, Mass.

We are attaching hereto a subscription bonus certificate which we just received through the mail in which you offer to supply a copy of a new Specifications Handbook free of charge.

F. A. Beardsley
sales manager
National Forge & Ordnance Co.
Irvine, Pa.

The handbook will receive wide usage among the hundred-odd engineers of this department since the major part of

Continued on following page

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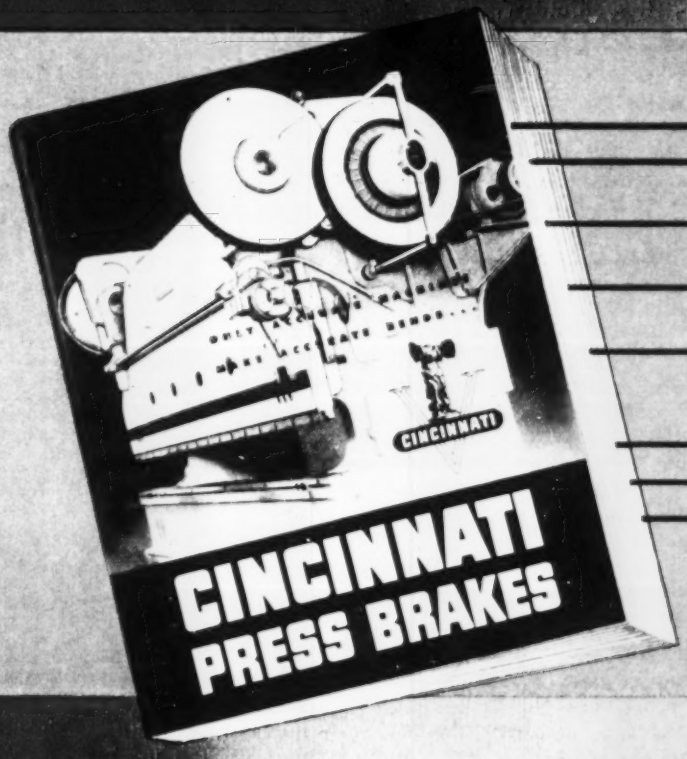

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Specifications and Dimensional Views of Cincinnati Press Brakes
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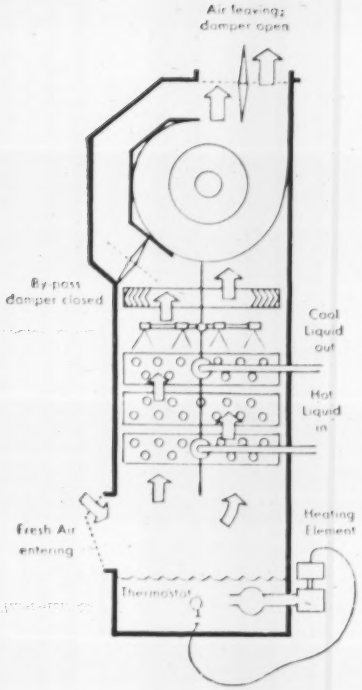
CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

NIAGARA Aero Heat Exchanger



U. S. Reissue Patent Nos. 22,533 and 22,533

1. Extends quenching capacity without extra water or cooling tower.
2. Quickly pulls down heat at initial peak load of Quenching.
3. "Balanced Wet Bulb" Control holds quench bath at proper temperature, heating if needed to start after shut-down, and cools or heats by automatic control.
4. Saves cleaning expense as compared to cooling tower which picks up acids and fumes from air.

APPLICATIONS	USED IN THE MANUFACTURE OF OVER 400 PRODUCTS INCLUDING
Quench Oils	Aluminum, copper, steel, nickel and alloys.
Cutting Oils	Diesel, aircraft, automotive and other engines.
Lubricating Oils	Chemical processes, plastics, adhesives.
Cooling water and brine	Gears, bearings, forgings and castings.
Cooling gas and compressed air	Wire, controls, electronic products.
	Ammunition, explosives, shells, ordnance, firearms.
	Farm machinery, tools, hardware.

For help in increasing production, saving of cooling water, write for Bulletin #120. Address

NIAGARA BLOWER COMPANY

Over 35 Years' Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. New York 17, N. Y.

Experienced District Engineers in all Principal Cities of U.S. and Canada

LETTERS

Concluded from preceding page

our work is covered by Navy contracts, and we must necessarily keep up-to-date on all the types of specifications covered in your cross-index.

H. W. Nelson
Engineering Department
Northern Ordnance Inc.
Minneapolis

. . . we are very much interested in securing a copy of your Specifications Handbook.

R. W. Bolsinger
secretary
National Radiator Co.
Johnstown, Pa.

Of course, we would not think of being without a subscription to STEEL . . . and we would like a copy of this Specifications Handbook.

Elder Jones
sales manager
Siskin Steel & Supply Co.
Chattanooga, Tenn.

We know that it will be of great help to us in our work.

D. S. Homburg
Hanna Engineering Works
Chicago

• *These are representative of the thousand of requests which have been received for* STEEL'S *Specifications Handbook. By this time most of those copies are on the way. Every subcription to* STEEL *is entitled to one copy of the handbook as a subscription bonus. (See pp. 133-134).—ED.*

Spark Test Suggested

I have noticed the question of Mr. F. P. Zierden, president, Zierden Co., Milwaukee, in your "Letters to the Editor" of Dec. 22 (p. 10), requesting information on the easiest possible method for salvaging tool steel bars on which the trade name and other identifications are missing. Perhaps the most economical and fastest way to do this is by means of the spark test in which the steel is held against a grinding wheel and the characteristics of the spark noted. Further detailed information on spark testing may be obtained from any of the tool steel companies.

M. C. Fetzer
head, physical metallurgy
Division of Metallurgical Research
Kaiser Aluminum & Chemical Corp.
Spokane, Washington

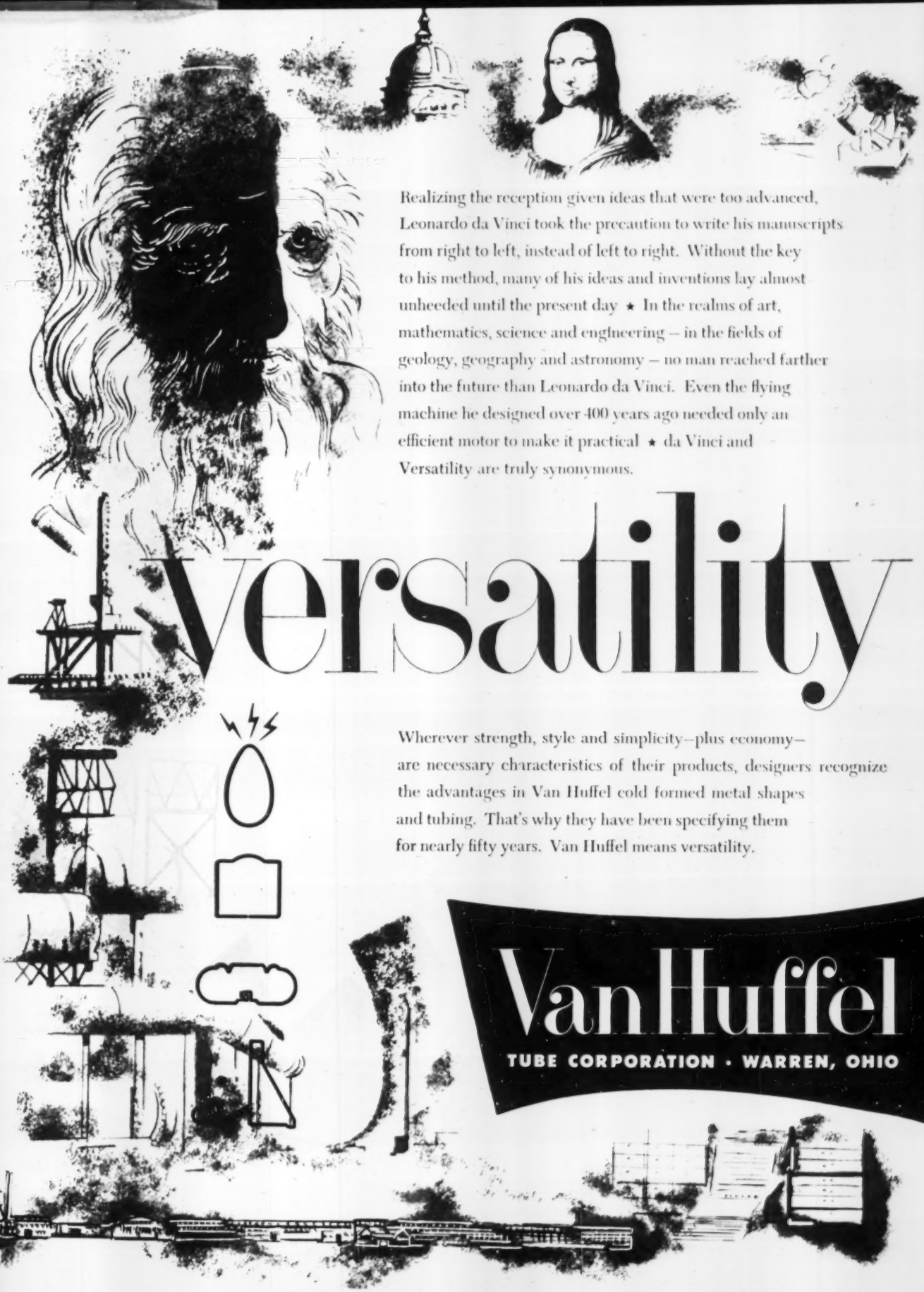
One Story vs Many Stories

On p. 97 of the Nov. 10 issue of STEEL, mention is made of a General Motors' material handling expert who advises checking multiple story storage buildings before building new one-story plants.

We are extremely interested in procuring any data or figures that caused this expert to arrive at his conclusion, or, if you would furnish us his name and address, in writing to him direct.

Guilford Glazer
Glazer Steel Corp.
Chicago

• *The man in question is Neil M. Loney, now retired from Fisher Body, 478 Twenty-Fifth Ave., St. Petersburg, Fla. —ED.*



Realizing the reception given ideas that were too advanced, Leonardo da Vinci took the precaution to write his manuscripts from right to left, instead of left to right. Without the key to his method, many of his ideas and inventions lay almost unheeded until the present day ★ In the realms of art, mathematics, science and engineering – in the fields of geology, geography and astronomy – no man reached farther into the future than Leonardo da Vinci. Even the flying machine he designed over 400 years ago needed only an efficient motor to make it practical ★ da Vinci and Versatility are truly synonymous.

Versatility

Wherever strength, style and simplicity–plus economy–are necessary characteristics of their products, designers recognize the advantages in Van Huffel cold formed metal shapes and tubing. That's why they have been specifying them for nearly fifty years. Van Huffel means versatility.

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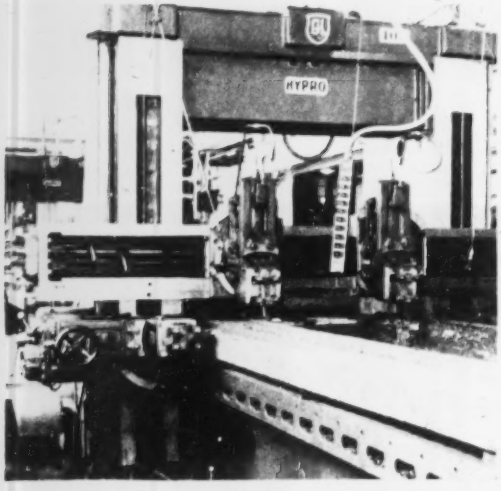
TUBE CORPORATION · WARREN, OHIO

WELDED · LOCK SEAM · OPEN SEAM · BUTTED TUBING · METAL SHAPES · MOULDINGS

Planing semi-steel at 300 feet per

G&L Hypro Planer's power and rigid construction permit year in, year out, optimum accuracy in high speed carbide cutting to 1" depth at feeds from 3/64" to 1/8"



This photo shows the G&L Hypro Planer's fourth cutting head. On this operation, all cutting heads are used — production is increased, setup time is minimized.

SINCE 1947, Rice Barton Corp. of Worcester, Mass., has been using two G&L HYPRO Double Housing Planers to produce parts for paper mill and textile machinery. With them, semi-steel castings (50 to 40% steel), are being planed at speeds from 240 to 300 surface ft. per minute . . . with depth of cuts from 1/4 to 1 inch . . . feeds from .045 to .125 inch. Mild steel parts are being planed at the same speeds, but at a maximum depth of 1/2 in. and a feed of approximately .050 inch.

Though shock on the carbide tools is very great due to irregular contours and interrupted surfaces, no tools have been broken in nearly a year of operation. This economical use of carbide tools is primarily possible because the G&L planers have the following features — sufficient power, (50-100 hp variable voltage drives) — double helical table drive which provides a straight flow of power with no side thrust — rigid construction of rail as well as rail head — and inverted dovetail slide construction.

If you'd like to know how G&L machine tools can help you speed your work by taking advantage of the latest cutting tool developments contact your nearest G&L representative and he'll be glad to give you the details on the G&L Job Analysis Service. If you don't know where to reach him, write direct.

GIDDINGS & LEWIS

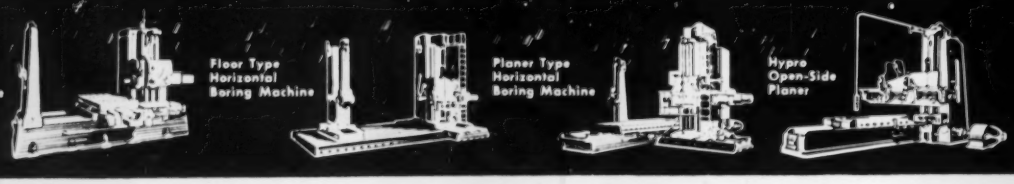
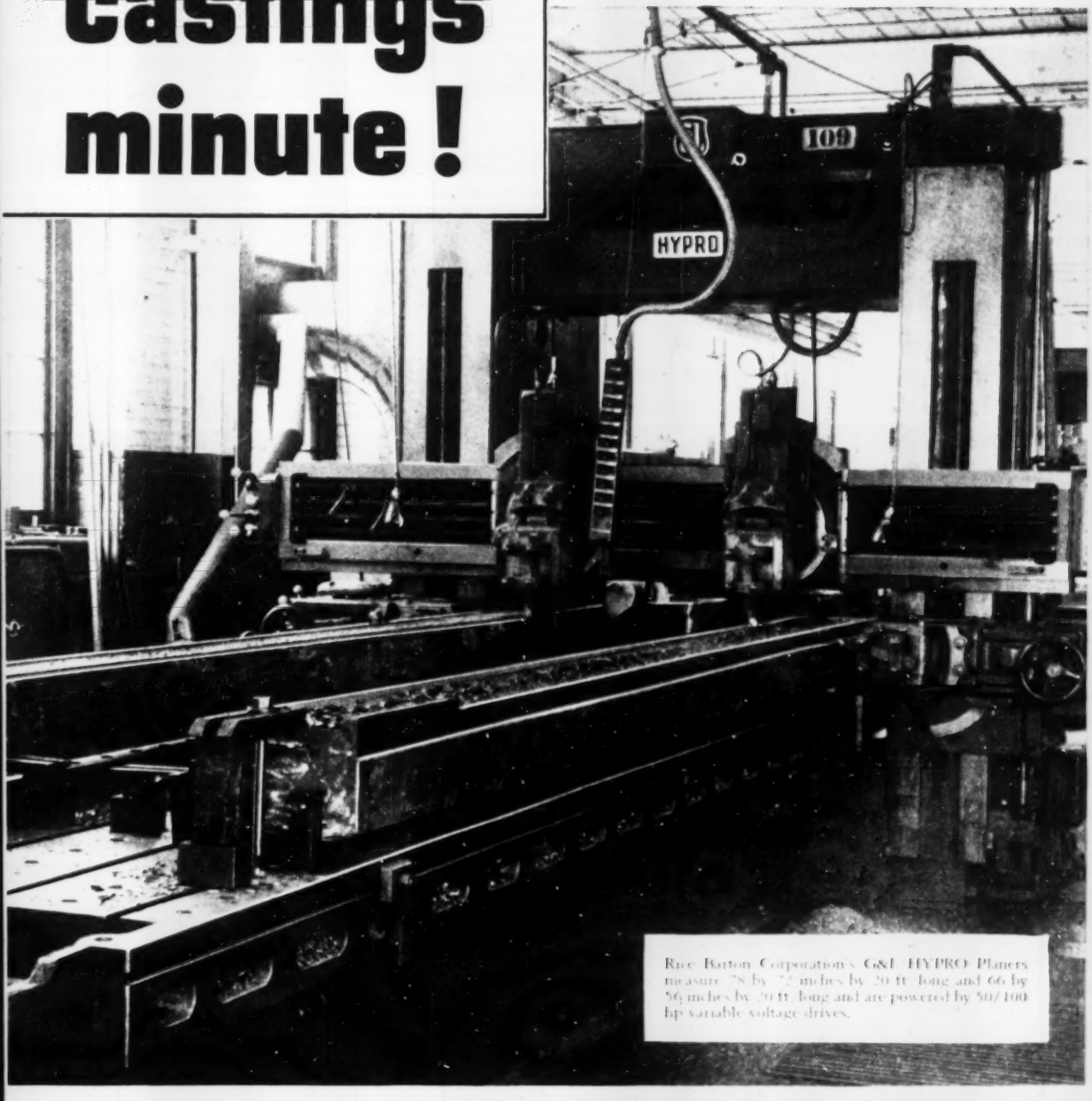


Table Type Horizontal Boring Machine
Floor Type Horizontal Boring Machine
Planer Type Horizontal Boring Machine
Hypro Open-Side Planer

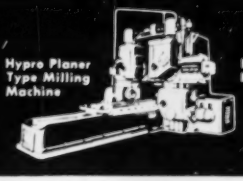
castings minute !

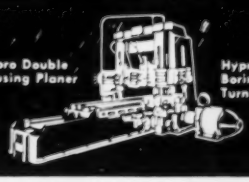


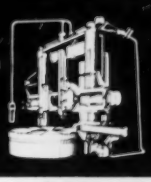
Rice Barton Corporation's G&L HYPRO Planers measure 78 by 72 inches by 20 ft. long and 66 by 56 inches by 20 ft. long and are powered by 50/100 hp variable voltage drives.

G-22

MACHINE TOOL CO.


Hypro Planer Type Milling Machine


Hypro Double Housing Planer


Hypro Vertical Boring and Turning Mill

G&L HYPRO

FOND DU LAC
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cut power blade costs at least 15% with

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Yes, that's right—when you order VICTOR Moly Power Blades from your Distributor, you cut your initial blade cost 15%, and you'll get extra economies through faster, more efficient cutting and longer blade life.

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1824

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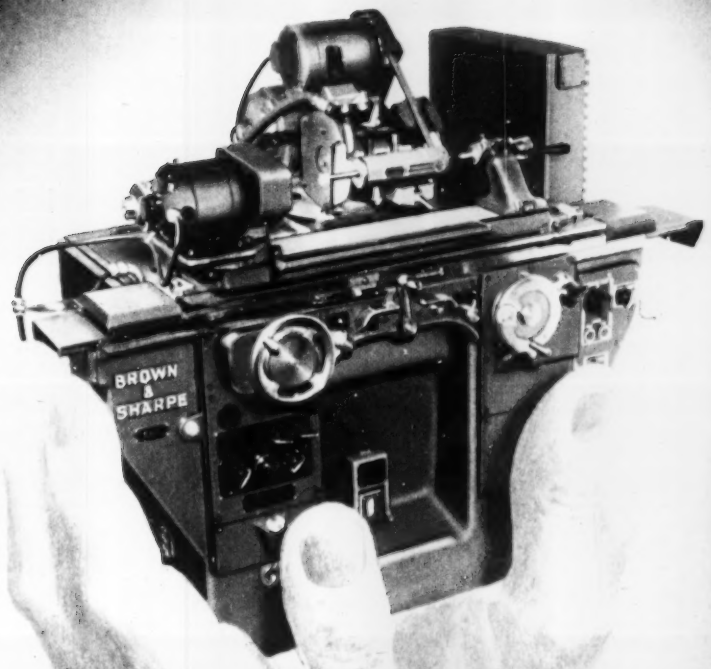
of Universal Grinding Machines



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BS

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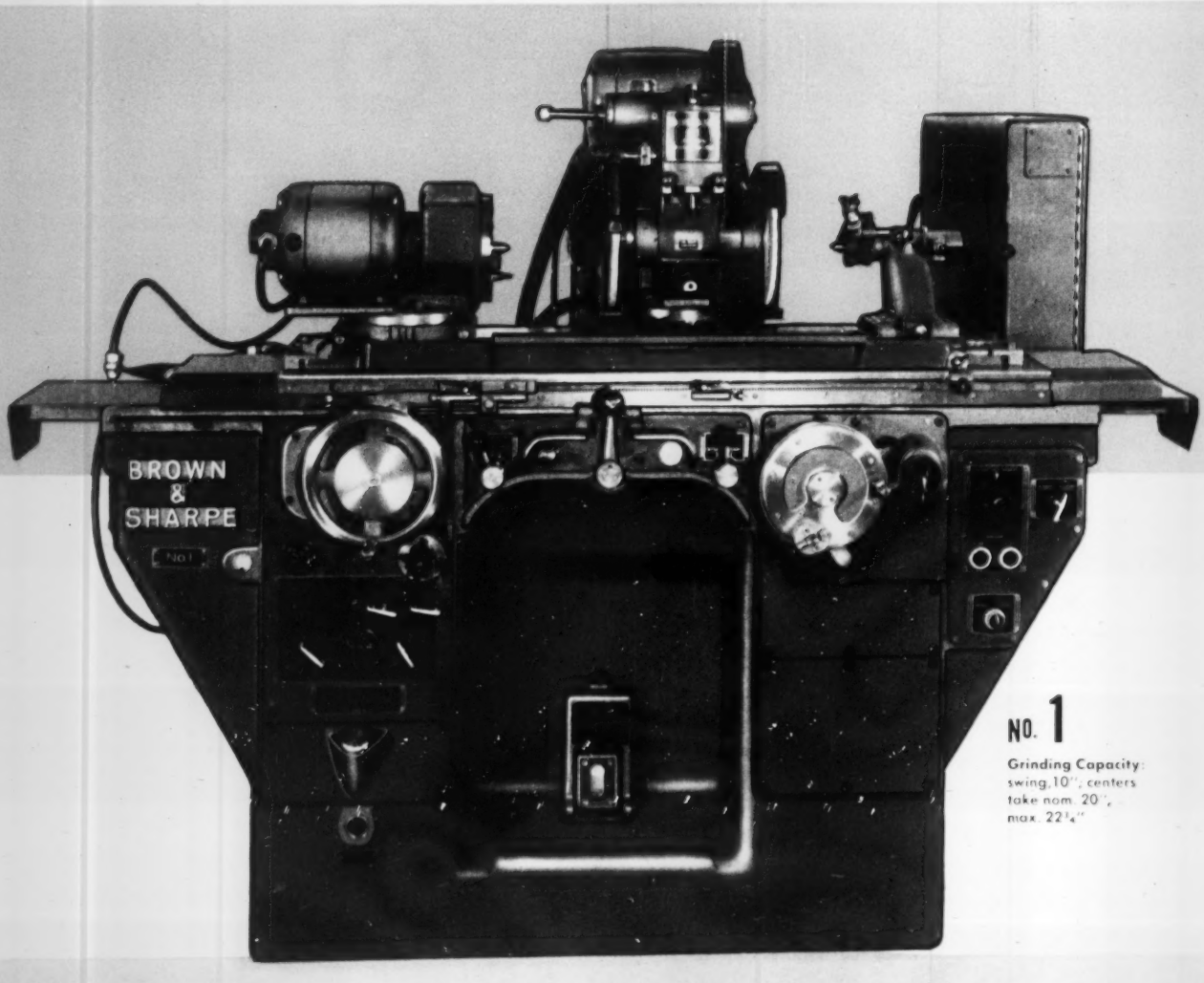
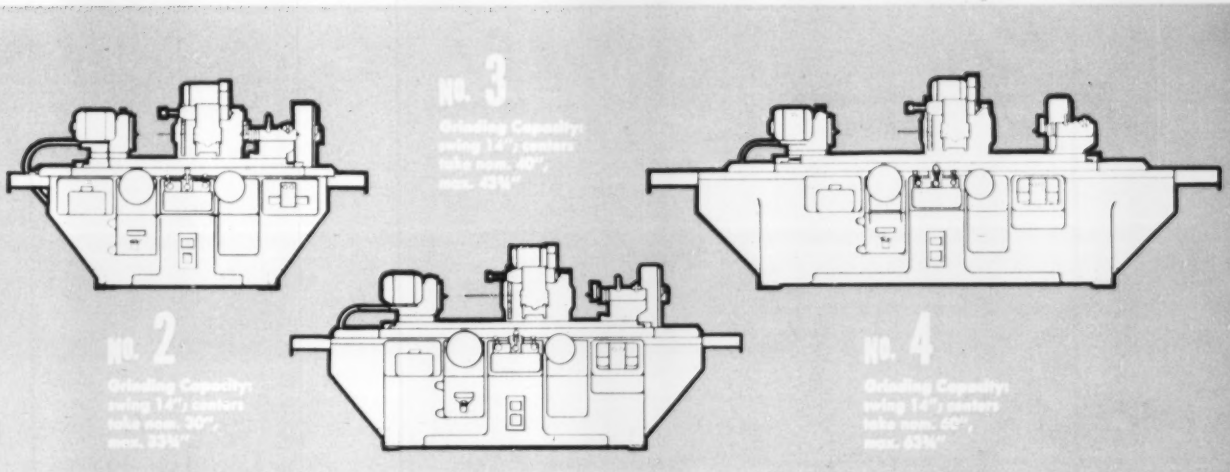


NO. 1

Grinding Capacity:
swing, 10", centers
take nom. 20",
max. 22¼"

Universal Grinding Machines

Productioneered to handle the widest variety of precision work at production speeds

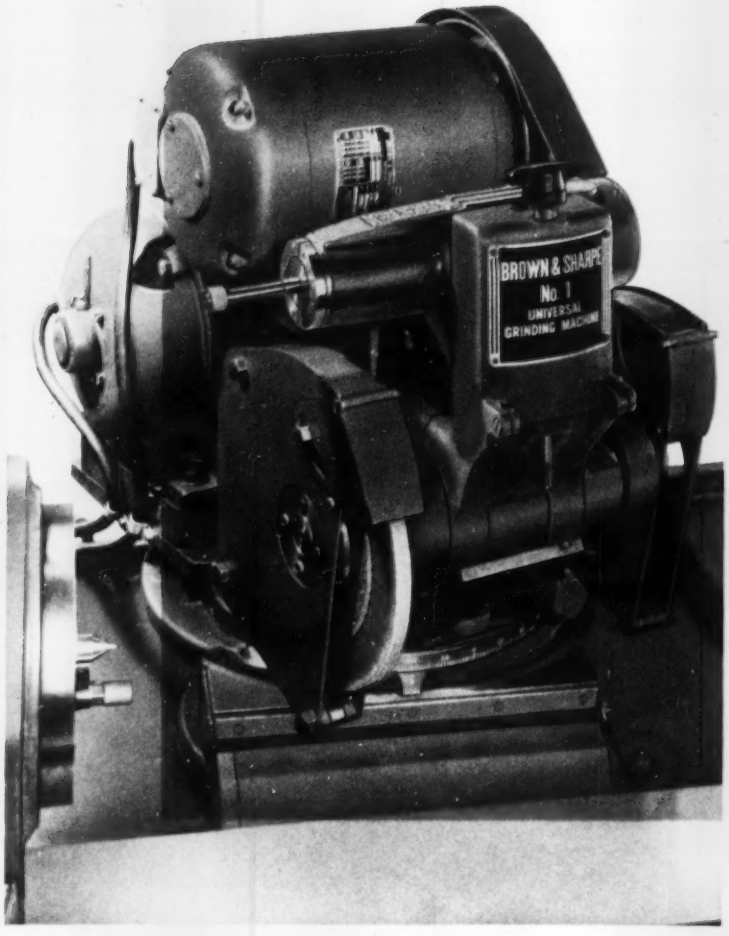


This entirely new line of Brown & Sharpe Universal Grinding Machines bridges the long-existing gap between conventional universal and single-purpose grinding machines. Years of extensive research and development . . . the combined talents of Brown & Sharpe engineers and craftsmen . . . have been employed to bring you this ultra-modern group of new Universal Grinding Machines. Their many new and exclusive features provide exceptional grinding flexibility, rigidity, and accuracy. Instant combining of operating functions into automatic cycles extends the usefulness of this equipment beyond the toolroom and job shop, to many production applications.

Compare these new Brown & Sharpe Universal Grinding Machines feature for feature . . . see the following page.

Brown & Sharpe B·S

Compare all these *productioneered* features



Completely Universal Wheel Spindle Unit

Design of wheel spindle unit permits either the external grinding spindle or the internal grinding spindle to be used in any desired horizontal position. Accurate compound settings can be made for combination straight and taper, or double taper grinding (both external and internal) with only one set-up.

- Removable Unit Type External Grinding Spindle
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- Hydraulic Table Drive Maintains Smooth, Constant Table Movement
- Variable Speed Headstock
- Table Throttle Permits Exact Repetition of Truing and Grinding Speeds
- Unique Universal Turret Provides Extra Work Capacity
- Faster, More Accurate Sizing
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- Built to Meet J.I.C. Electrical and Hydraulic Standards
- Additional Automatic Functions Available to Increase Productive Flexibility

Get complete specifications on these new ultra-modern Universal Grinding Machines and their diversified equipment — write for illustrated Bulletins.

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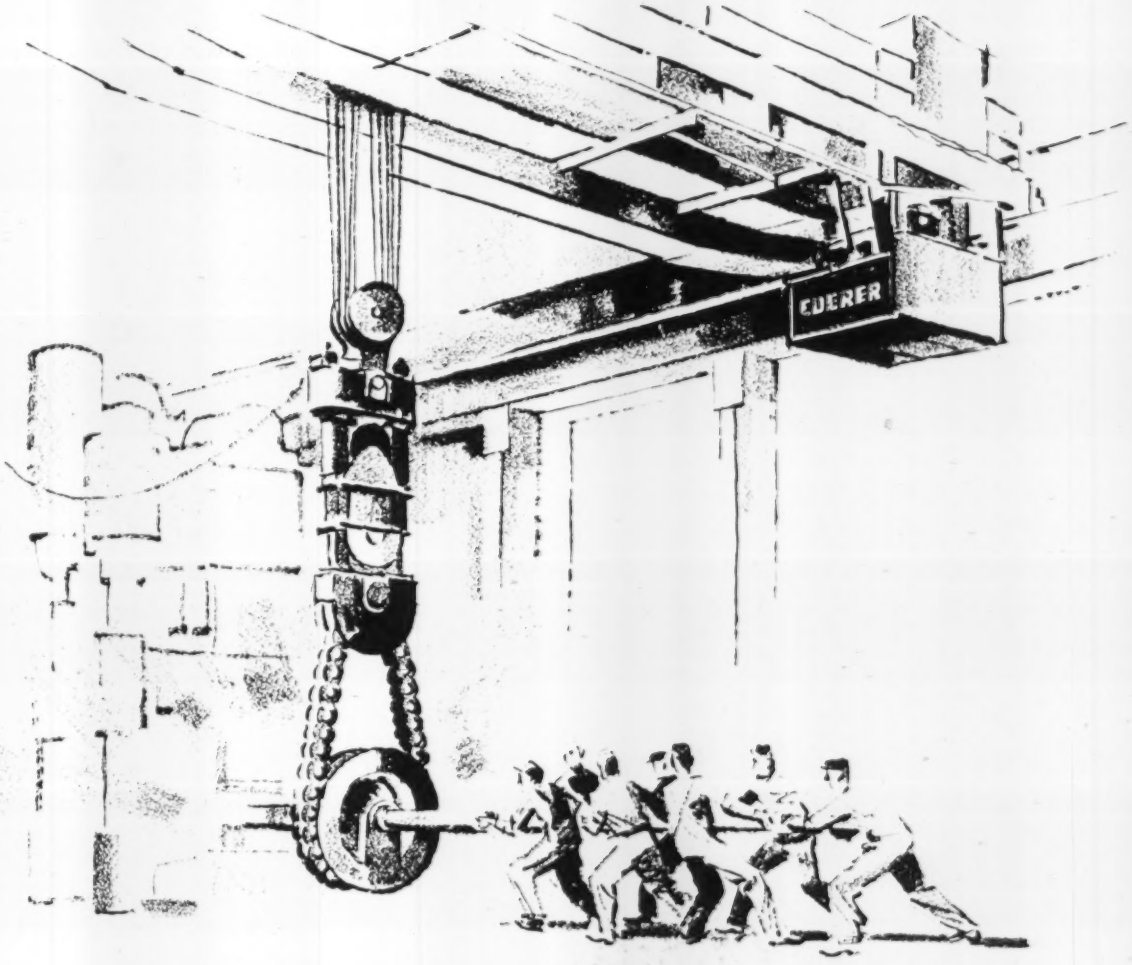

For Heavy Duty Forge Shop Service

At the Isaacson Iron Works, large fabricators of heavy steel equipment and forgings, requirements for a crane to serve their 1500-ton steam press are exacting. EDERER "job-engineered" this heavy duty 50-ton crane to these exact requirements. It has been in continuous service for the past 9 years—handling some of the heaviest forgings made on the Pacific Coast.

EDERER—one of the largest crane manufacturers in the West—can "job-engineer" a crane for your particular requirements. Delivery can be made to meet your schedule for plant expansion or new construction.

Write for Crane Bulletin CR-500

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CRANES

50 YEARS "JOB ENGINEERING" CRANES FOR INDUSTRY

This heat-treating container lasted 20 HOURS

(Steel)

BOTH ON THE SAME JOB

This one lasted 2½ YEARS!

(MULTIMET Alloy)

Here are two heat-treating containers that were used in the same service—for pack annealing metal parts. In operation, they were exposed to temperatures as high as 1300 deg. F.

The steel container disintegrated at the end of only 20 hours in this service. The one made from MULTIMET alloy was ready to take even more punishment after two and one-half years. Similar savings can be obtained by using MULTIMET alloy for many other types of heat-treating equipment where stresses at high temperatures and corrosion take a heavy toll on steel parts.

For complete information on MULTIMET alloy, including properties and fabrication methods, write to the nearest district office for the booklet, "HAYNES Alloys for High-Temperature Service." The booklet also gives data on 9 other high-temperature alloys.

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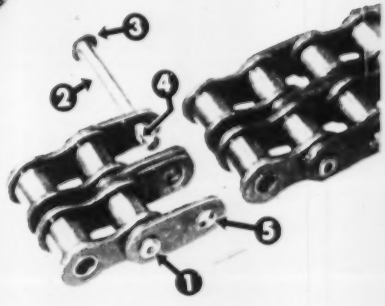
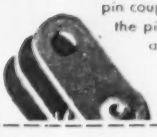
Maybe you can find a use for Improved Baldwin Assembly Multiple Width Riveted Roller Chain... IF you want to save money . . . save costly down time . . . speed up chain assembly . . . simplify chain inventory and stocking! It's not particularly sensational . . . just the handiest, most usable riveted roller chain yet! Here's all there is to it. It's just a ten foot strand riveted multiple width chain with exclusive Single Pin Couplers installed at convenient intervals in the strand, so that any length of chain may be made up, in a hurry, without cutting the chain or damaging chain parts. It's just as easy to couple and uncouple as cottered chain. BUT the entire strand retains the added life of riveted chains. Your shop can install these chains in a hurry . . . save plenty by cutting "down time." Chain is shipped in boxes with a ten-foot assembled length in each box. Why not get the complete story. See your local Rex Distributor, or just mail the coupon.



HERE IT IS: One end of the single pin coupler link is firmly riveted to the adjacent link (1). The unique Coupler Pin (2) has a spun washer (3) on one end, the other has a milled flat (4) and locking pin. The pin is an easy fit through the chain except for the milled flat end which is press-fitted into a special matching hole (5) of the single pin coupler plate. You need only drive the pin the length of its milled flat in assembling or disassembling the chain. It's easy . . . saves time, effort and money.



BALDWIN-REX ROLLER CHAINS

A PRODUCT OF **Chain Belt** COMPANY OF MILWAUKEE

55-405A

CHAIN BELT COMPANY
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Gentlemen:
Please send my copy of Bulletin No. 52-2

Name.....

Firm.....

Address.....

City.....*Zone*.....*State*.....

ANNOUNCING A NEW

Gerrard Tying Machine...

FULLY AUTOMATIC B.S.M. TWINE SEALING MACHINE

• Here's a new, completely automatic tying machine that may fill a need in your plant . . . the Gerrard B.S.M. Twine Sealing Machine. Just place the bundle in the tying area, step on the pedal, and in three seconds, the twine is wrapped around the bundle, drawn to a pre-set tension, securely fastened with a *metal seal*, and cut. The bundle is firmly gripped and the tie will remain neat, strong and tight until the twine is cut. Several ties can be put around a bundle as quickly as it can be moved into position. .

Look around your mailing or shipping department. There may be several spots where a Gerrard B.S.M. Twine Sealing Machine can save you time and money, and do a better tying job at the same time.

SEND FOR FOLDER DESCRIBING THE GERRARD TWINE SEALING MACHINE. IT'S FREE.

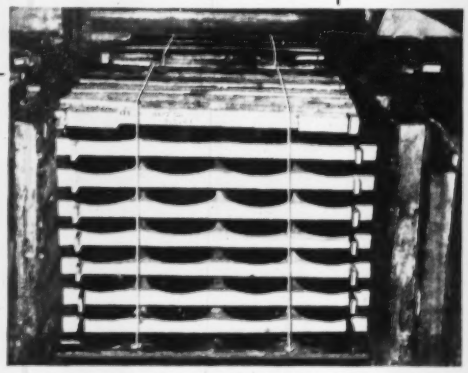
THE GERRARD B.S.M. TWINE SEALER IS completely automatic, makes a 1-cycle wrap, and secures the twine with a metal seal so firmly that the twine will break before the seal will slip. Bundles are limited to a 14" width and a 9" height.

On heavy tying jobs...be safe...save money... use Gerrard Steel Strapping

• Gerrard Round Steel Strapping, in 8 to 18½ gauge, was designed for safe, dependable, easy strapping of small packages, larger cartons and crates, heavy cases, pallets, and for reinforcement of carload lots of steel pipe, plates, sheets and machinery. With Gerrard's hand-operated machines, or the semi-automatic Model Q, you can make firm, tight closures or secure reinforcements that will keep your shipments safe from plant to destination. And Gerrard Round Steel Strapping costs about 40% less than any other metal reinforcement.

ASK US FOR FULL INFORMATION

Phone, write or wire for further information about the Gerrard Method of Steel Strapping or of Twine Sealing. A Gerrard engineer will gladly call, without obligation, to discuss your packaging and bundling requirements. Also ask for a free copy of the Blue Book of Packaging.



BRAKE DRUMS are palletized for inter-plant shipment, a good example of what can be done with small, odd-shaped units. 10 gauge Gerrard Round Steel Strapping holds the pallets securely.

U·S·S GERRARD STEEL STRAPPING

USS

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION
4745 South Richmond St., Chicago 32, Ill.

UNITED STATES STEEL

NEW FRACTIONAL H.P. MANUAL STARTER HAS *ALL* THE FEATURES!

right:
Class 2510
Basic Starter Mechanism

DESIGN LEADERSHIP IN THESE FEATURES:

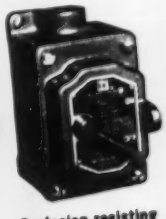
- ✓ Quick-make, quick-break contact mechanism
- ✓ Single or double pole construction
- ✓ Double break contacts of fine silver
- ✓ Modern styling
- ✓ Straight-through wiring with convenient terminals—generous wire space
- ✓ Dependable melting alloy type overload protection—trip-free
- ✓ Definite trip indication
- ✓ Interchangeable overload relay units accessible from the front
- ✓ Open type starter can be used with standard switch box and flushplate

a Variety of Enclosures

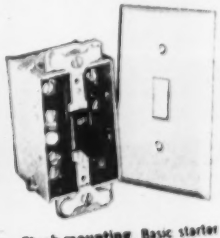
General purpose enclosure — with or without pilot light

Water-tight and dust-tight enclosure

Water-tight and dust-tight with pilot light



Explosion-resisting enclosure. For hazardous locations — Class I Group D and Class II Groups E, F and G.



Flush mounting. Basic starter mechanism can be used with standard switchbox and flush plate — or with flush plate only for machine tool cavity mounting.

RATINGS

Double pole
1 H.P., 115-230 volts A.C. or D.C.

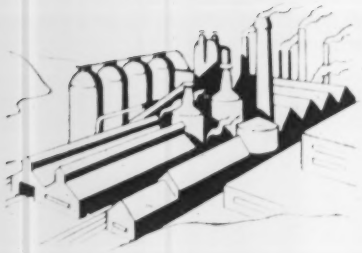
Single pole
1 H.P., 115-230 volts A.C. and ½ H.P., 115-230 volts D.C.

Write for Bulletin 2510A. Address Square D Company, 4041 N. Richards St., Milwaukee 12, Wisconsin.

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

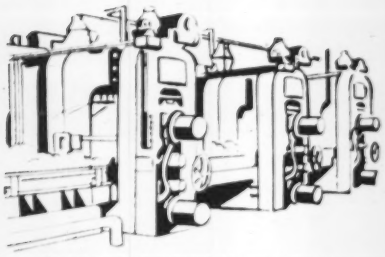
SQUARE D COMPANY

1903 · 50 YEARS OF DESIGN LEADERSHIP · 1953

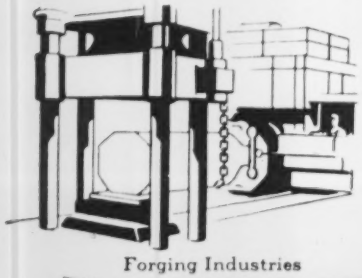


Steel Producing Plants

WHEN A *REGULAR LUBRICANT* ISN'T GOOD ENOUGH . . .



Hot Strip, Cold Reduction and Temper Pass Mills



Forging Industries

SPECIFY LEADOLENE* *Klingfast*

The "I.P."* LUBRICANT

On the really tough jobs in the steel industry, the answer to vastly reduced lubricating costs and extended equipment life is *Leadolene Klingfast*. Capable of withstanding pressures up to 50,000 p.s.i., this lead-base lubricant with its "indestructible pH-ilm" has proved itself repeatedly on the most difficult applications.

For efficient lubrication in the presence of water . . . for extreme adhesiveness to steel under high heat conditions . . . for unexcelled abrasion and corrosion-resistance . . . for actual cash savings up to 400 per cent—investigate the performance characteristics of *Leadolene Klingfast*.

CHECK THESE 9 IMPORTANT FACTS:

1. **EXTREME PRESSURE pH-ilm STRENGTH** of 50,000 lbs. per square inch minimum by "Timken" testing machine.
2. **ADHESIVENESS** in which affinity for steel and other metals develops maximum adhesion and prevents drippage or creeping. Retains a flexible coating in nature.
3. **WATER REPELLENCE** which retards washing off, creates a lubricating pH-ilm under moisture or water conditions.
4. **CORROSION PREVENTION** is an excellent protective coating in that it will not etch or corrode metals. Is never acidic.
5. **COMPOUNDED STABILITY**—Will not bleed or change physical condition within range of higher than usual temperatures for this type of lubricant.
6. **LOW TEMPERATURE FACTORS**—While having a solidifying action by decreased temperature as low as —40 F., it does not harden, crack or decrease in adhesion. The flexible coating withstands distortion of the application.
7. **ABRASIVE RESISTANCE**—Extremely high for a lubricant. Does not wipe off nor will be removed in handling by workmen's hands or gloves. Is extremely repellent to adhesion of scale, metallics and other forms of dusts or contamination.
8. Klingfast has remarkable corrosive resistance ** salt or sea water, acidic vapors and solutions.
9. Klingfast can be removed by ordinary solvents such as kerosene, gasolene, naphtha, carbon-tetrachloride and similar substances but is highly impervious to lubricating oils and greases.

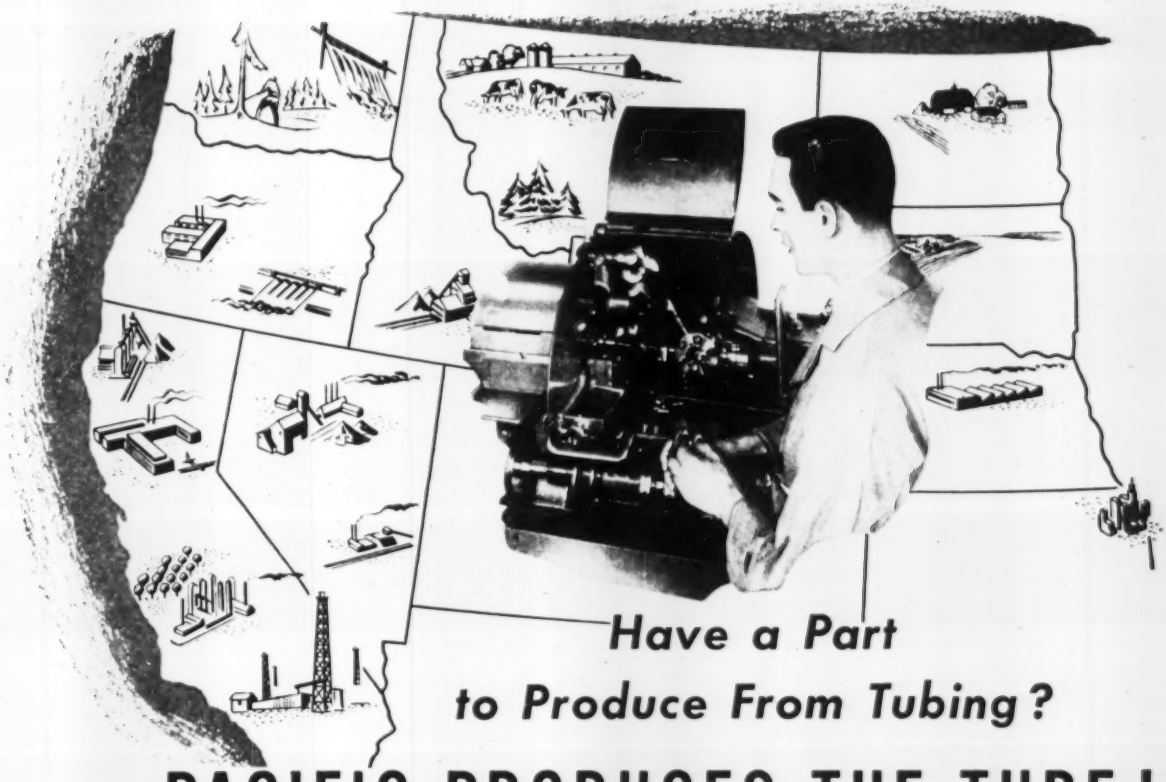
"I. P. . . . ("Indestructible pH-ilm" lubricant)

Write for 24-page descriptive booklet

THE BROOKS OIL CO.

Since 1876

Executive Offices and Plant	Cleveland, Ohio
Executive Sales Offices	Pittsburgh, Pa.
Canadian Offices and Plant	Hamilton, Ontario
Cuban Office	Santiago de Cuba



Have a Part to Produce From Tubing?

PACIFIC PRODUCES THE TUBE!

Sizes and Analyses

TUBING

SEAMLESS CARBON
MT—1015, 1020, 1025
Round: 3/16" to 2 3/4" O.D.
Square: 1/4" to 2" O.D.

SEAMLESS ALLOY
4130—NE 8630
Round: 3/8" O.D. to 3 1/4" O.D.
Square: 1/4" to 2" O.D.

CHROME
4%-6%, 6%-8%, 8%-10%
3/16" to 1 7/8" O.D.

STAINLESS STEEL
Seamless and Welded
Types 304, 316, 321, 347
Round: 1/4" to 2 7/8" O.D.
Square: 1/4" to 1 7/8" O.D.

WELDED CARBON TUBING
3/4" to 3" O.D.

BARS

C 1018, B1113
COLD FINISHED
3/8" to 2 1/2"
For Other Shapes, Contact Mill.

If you are fabricating tubing into finished parts . . . manufacturing small parts that require piercing before forming or machining . . . if your process or product requires a conductor for fluids, or strong, light-weight structural parts . . . you can profit by calling Pacific Tube Company. We can serve you quickly and economically.

Pacific has the modern tube mill and the facilities for the *quality* production of tubes, rods and bars in a wide range of sizes and analyses. All of Pacific's production is drawn and finished to suit the most exacting specifications for dimension, analysis and finish. In addition, we may be able to help you solve tubing problems with assistance in metallurgy, engineering or design.

Get more information about Pacific Tube Company products and service today. Clip and mail the coupon for our newest Tubing Bulletin or to have a representative call. No obligation, of course.

West Coast Distributors for:

Superior Tube Company, manufacturers of fine small tubing in all analyses from .010" to 5/8" O.D. and in certain analyses (.035" max. wall) up to 1 3/8" O.D.

YOU CAN'T BEAT **PATCO** FOR TUBING

PACIFIC TUBE COMPANY

First Steel Tube Mill in the West

PACIFIC TUBE COMPANY
5702 Smithway Street
Los Angeles 22, Calif.

Gentlemen:

☐ Please rush me your new Tubing Bulletin.

☐ Have your representative call.

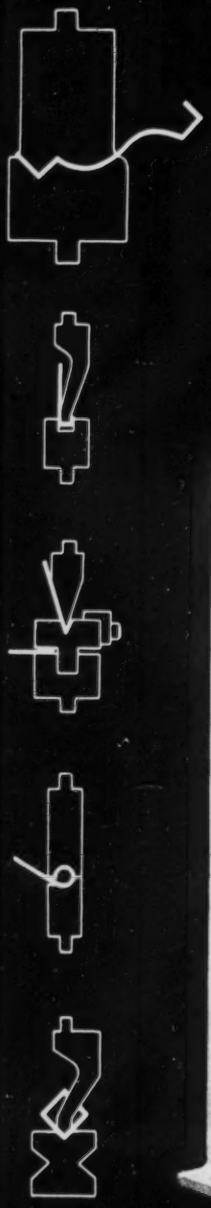
NAME_____

FIRM NAME_____

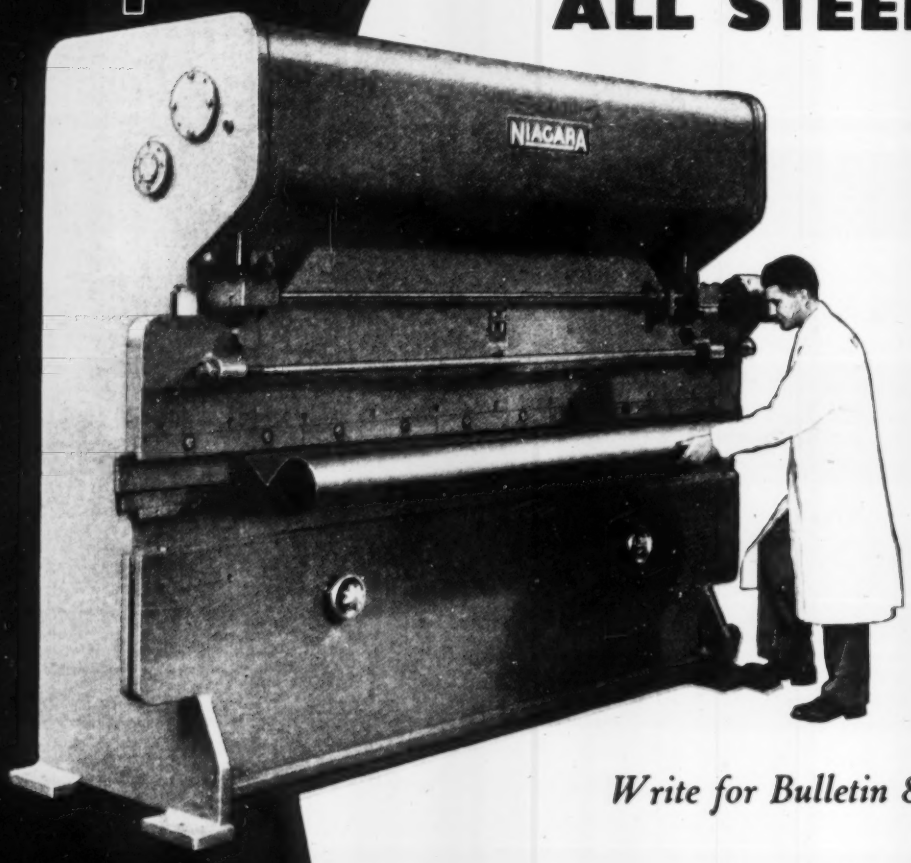
ADDRESS_____

CITY_____ ZONE____ STATE_____

NIAGARA



A NEW ALL STEEL



Write for Bulletin 89

versatility - high

BENDING • CURLING
FORMING • CORRUGATING
DRAWING • BLANKING
BEADING • EMBOSSING

50 TON SERIES

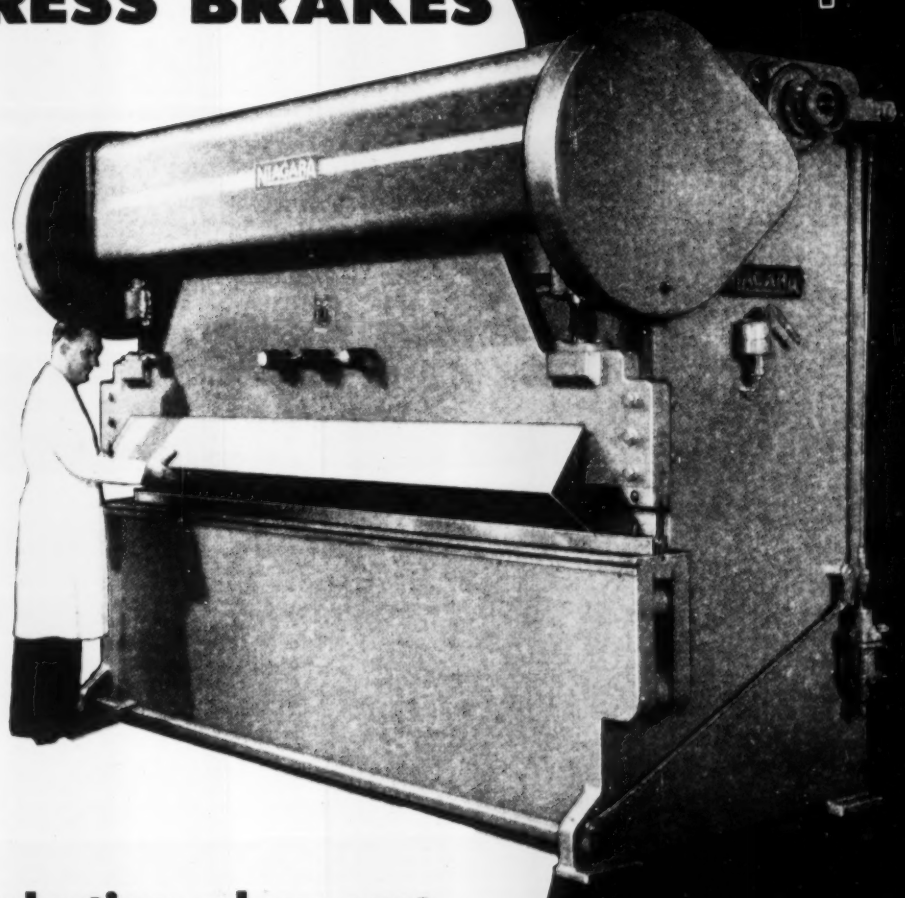
For Fabricating Sheet Metal and Light Plate

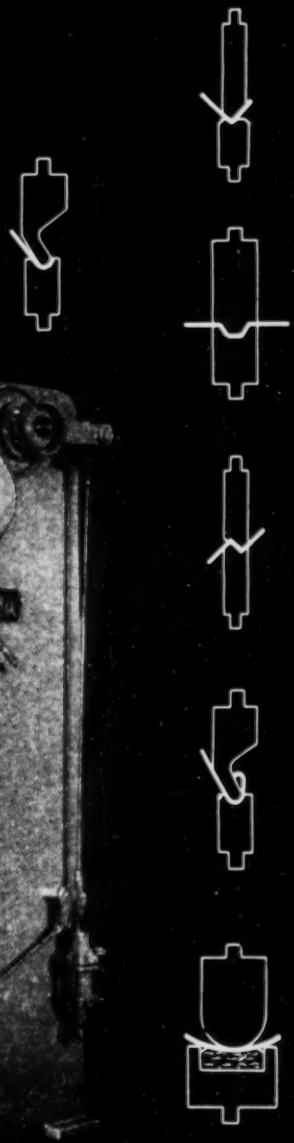
THESE HIGH SPEED PRESS BRAKES are perfectly suited for the smaller and lighter jobs that do not justify a large investment in equipment. They offer the advantages of big brake performance by incorporating features ordinarily found only in large expensive machines.

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

ANNOUNCES

LINE OF PRESS BRAKES





production - low cost

JOGGLING • PERFORATING
NOTCHING • SLITTING
PUNCHING • TRIMMING
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100 and 150 TON SERIES

For Fabricating Heavy Plate
(In addition to sheet metal)

THESE ULTRA MODERN, HEAVY DUTY PRESS BRAKES represent the ultimate in quality, stamina and performance. They are built to the highest standards of accuracy and workmanship for peak production under the most severe conditions.

America's Most Complete Line of Presses, Shears, Machines and Tools for Sheet Metal Work

DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK • PHILADELPHIA

Dealers in principal U. S. cities and major foreign countries

now . . immediate delivery!

LINDBERG G-10 BOX FURNACES

Maximum heating temperature . . 3000° F.

Continuous Operation . . 2500° F.

Expanded plant capacity now enables us to put the "immediate delivery" tag on the popular Lindberg G-10 Laboratory Box Furnace.

Now is the time to order *your* Lindberg G-10 . . it's just the thing for today's complete and ultra-modern laboratory! Check these features of the G-10 . . features that make it a versatile, rugged and dependable unit.

Precision heating . . The model G-10 reaches and holds selected temperatures within plus or minus 1° F. at higher temperatures. Control is by a Lindberg "Lab-type" indicating controller pyrometer . . it's entirely automatic . . operates electronically.

Fast heating . . The 3000° F. top heating capacity provides any lower operating temperature desired (300° F. minimum), quickly and positively.

Uniform heating . . Heat is evenly distributed by 10 silicon carbide Globar heating elements . . equally spaced at top and bottom of the work chamber.

Compact, Self-contained . . The Lindberg G-10 is a "package" unit . . all you have to do is hook it up. All controls and equipment are in the furnace housing. Work chamber dimensions are 6" wide x 12" deep x 4¾" high. And overall measurements are only 27" from front to back . . 24" wide . . and 56" high.

The G-10 can also be used as a muffle furnace, or with carbon blocks for nonoxidizing atmospheres.

The Lindberg G-10 is a natural for your laboratory! For detailed information call your laboratory equipment dealer, or write Lindberg Engineering Co., 2450 West Hubbard St., Chicago 12, Illinois
Ask for bulletin No. 1000.

LINDBERG LABORATORY EQUIPMENT

Lindberg Engineering Company, 2441 West Hubbard Street, Chicago 12, Illinois

first quality

DIE STEELS

for

HOT WORK

HOTFORM The original 5.00% chromium hot work steel—more widely used than any other type. Ideal for die casting dies, shell piercing tools, extrusion press tooling (for aluminum, magnesium, soft brass).

MARVEL High tungsten, tough, retains hardness at high heat. Popular for hot press and hot forging dies for brass and steel, refractory brass extrusion, hot swaging, hot shearing, etc.

and

HOTPRESS

FORGE DIE

SC SPECIAL

WW HOTWORK

RED CUT SUPERIOR

J-Temper

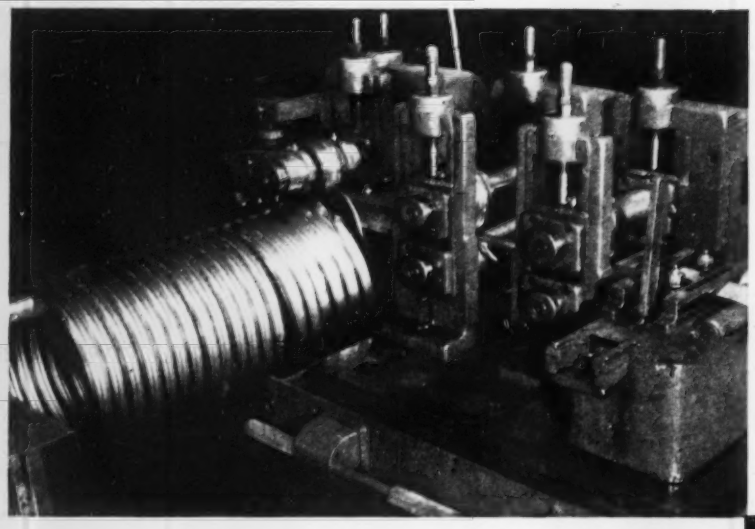
-write for details!

Vanadium-Alloys Die Steels for Hot Work are produced in grades covering the complete range of applications in this field. Each grade, distinguished by brand, embodies the specialized experience of almost half a century devoted *exclusively* to the production of fine tool and die steels. Whatever your hot work requirements, you'll find profitable fulfillment in our First Quality Die Steels. Our Research Department and metallurgically-trained sales representatives will gladly assist you in correct selection. *Let us send you our booklet on Die Steels for Hot Work.*

FIRST QUALITY TOOL STEELS

Vanadium-Alloys STEEL COMPANY

COLONIAL STEEL DIVISION • ANCHOR DRAWN STEEL COMPANY

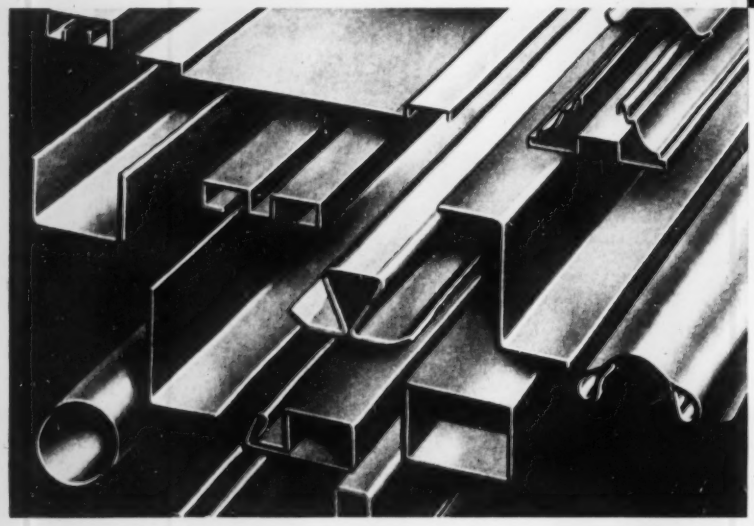


Curving Coiling and Ring Making

IN A COLD ROLL FORMING MACHINE

CURVING and coiling to almost any diameter, are two out of many operations which can be performed in a Yoder roll forming machine. As fast as formed, the sections can be continuously coiled and cut to length to make rings for auto hub caps, headlights, wheel trim, stator rings, etc., at a huge saving in cost of materials and labor.

Among other operations which can be tied in with cold roll forming may be mentioned embossing, notching, perforating, welding, flattening, lock-seaming, filling and closing tubular shapes, wrapping, edge trimming, etc.



In the design and assembly of production lines of this character, the know-how of the Yoder engineering staff is at your service. The Yoder book on Cold Roll Forming deals broadly with the most important phases of the subject. Ask for it.

•

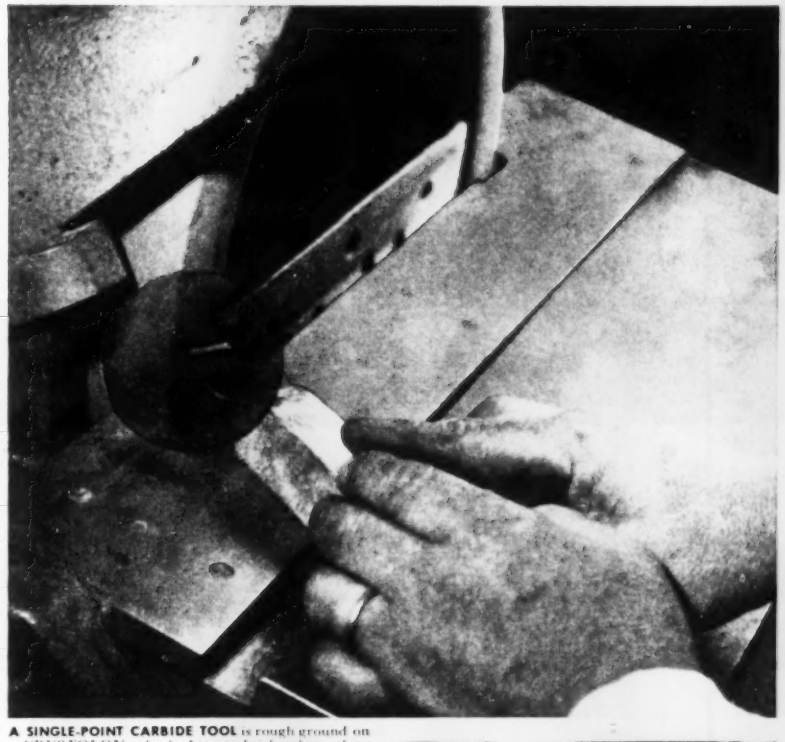
THE YODER COMPANY
5502 Walworth Avenue
Cleveland 2, Ohio

Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding

ENGINEERING YODER MANUFACTURING

Add this cost-cutting "TOUCH OF GOLD" to your carbide grinding...



A SINGLE-POINT CARBIDE TOOL is rough ground on a CRYSTOLON wheel. A typical job where these fast-cutting, cool-cutting silicon carbide wheels are proving their worth as cost-cutters.

Save your diamond wheels with Norton CRYSTOLON* wheels!

Right now, conserving your diamond wheels is not only desirable, *it is vital.*

On many carbide grinding jobs Norton CRYSTOLON (silicon carbide) wheels will give you results equally as good as diamond wheels — plus big savings. In fact, the skillful teaming of Norton CRYSTOLON wheels *with* Norton diamond wheels assures you the true, value-adding "Touch of Gold" that means carbide tools at their very best.

Where CRYSTOLON Wheels Save

In recent tests in offhand grinding of single-point carbide tools, silicon carbide wheels cost about ⅛ as much to use as diamond wheels — *per unit of carbide removed.* And a 60 grit silicon carbide wheel gave as fine a finish as a 100 grit diamond wheel!

Of course, for grinding your multi-point carbide tools and similar jobs, you'll still want Norton diamond wheels in the desired bonds and grit sizes. But for many other applications, especially roughing, it will pay you to switch to CRYSTOLON wheels. We make them in grit sizes up to 200, resinoid bonded or in the new vitrified K-Bond — which is quality-controlled to produce half-grade increments of hardness, enabling you to "pin-point" your exact specifications.

See Your Norton Distributor

for practical aid in selecting the most economical Norton wheels — CRYSTOLON abrasive or diamond abrasive — for your needs. If necessary, he'll call in your Norton Abrasive Engineer for expert consultation. Backed by the world's largest manufacturers of abrasives, these Norton team-workers are ready to help you add the product-improving, money-saving "Touch of Gold" to every grinding job you do.

Get These Up-to-the-Minute Facts

The December issue of *Grits and Grinds*, the Norton monthly magazine on grinding, contains no less than three articles on carbide tool grinding by well known Norton technicians. For valuable information on how to cut your grinding costs and improve quality, write us for your copy — also for these two helpful booklets on carbide grinding and how to make diamond wheels last longer. NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

CARBIDE TIPS ON A FACE MILL get keen cutting edges on a Norton diamond wheel — the most efficient and economical wheel for multipoint tool grinding.

NORTON WHEELS FOR THE "TOUCH OF GOLD" in carbide grinding include diamond wheels in three bonds — vitrified, resinoid and metal and CRYSTOLON wheels in two bonds — vitrified and resinoid.

NORTON ABRASIVES

Making better products to make other products better

W-1467

SLASH DOWN-TIME FOR HOT REPAIRS WITH PERMANENTE 84!

Don't let excessive down-time for hot repairs prevent you from getting maximum production from your open hearth or electric steel furnace.

Slash down-time to a minimum with patented Permanente 84 *periclase* ramming and patching mix—and increase your ingot production per year.

Because Permanente 84 is dependable and easy to use, *faster hot repair* is possible. And because it gives superior bottom performance, *fewer repairs* are required between heats. Here's why:

Permanente 84 is processed from high purity sea water magnesia—gives an unbeatable combination of high refractoriness and chemical resistance. Its high density and chemical purity minimize penetration of slag and metals.

Get Permanente 84 *now* for open hearth and electric furnace rebuilds as well as for bottom, bank and tap hole maintenance.

Your Kaiser refractory engineer will give prompt attention to your refractory problem—will offer, where desired, research, design and installation service to give you maximum production most economically. Write for descriptive literature on Permanente 84 and the companion ramming mix, Permanente 165. Principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron 8, Ohio.

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Basic Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase

another reason why more threading shops say—

"we've standardized on VERS-O-TOOL"

You probably know Vers-o-tools as the self-opening, precision die heads that feature the circular-ground thread type of chaser—

- **the kind that give as many as 200 grinds.**
- **the kind that are micrometer gauge checked on their blocks before and after each grind, so that the first piece cut will be right—no removal of head, no fussing to get size, no scrap.**

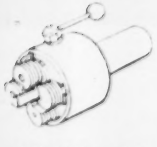
Vers-o-tools are the most versatile tools, produce more per dollar of investment—cost less. That's why so many experienced users say, "We've standardized."

How about the shorter runs?
Simply substitute the Adjustable Blade Chasers and Blocks for circulars in the same Vers-o-tool head. They also have ground threads and the cost is less.

Hollow Milling?
End forming and turning cutters, both circular and blade-types, cut three times faster than single point tools, snap open and leave no marks, also knurls and burnishing rolls.

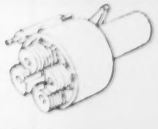
Interchangeable?
All chasers, mills or rolls, circular or blade-type, are, with their blocks, used in both revolving and non-revolving Vers-o-tools, die size for size.

DT-52 is the complete new catalog on Vers-o-tools and Namco Solid and Collapsible Taps.



Style DS Vers-o-tool (Non-revolving Type) 10 Sizes, ⅛"—6½"

Style DR Vers-o-tool (Revolving Type) 13 Sizes ⅛"—6½" Shown with Adjustable Blade Chasers 7 Sizes, ⅛"—2"



Style DBS Vers-o-tool (for B&S Automatics) 3 Sizes, ¼"—⅜".

Time Saving... that's it!

Change chasers in less than 2 minutes—just lift reset handle, slide back the hood and they drop out—no screws, no adjustments, patented.

Time saving—that's it! . . . And that's one big reason why makers of smooth class 3 high pressure threads whose 'round-the-clock schedules often run into millions of a kind STANDARDIZE on Namco Vers-o-tools.

24-HOUR DELIVERIES ON MOST STANDARD STOCKABLE NC AND NF CHASERS AND BLOCKS — ALSO NATIONAL TAPER PIPE AND DRY SEAL

The NATIONAL ACME CO.

170 EAST 131 STREET, CLEVELAND 8, OHIO.

Acme-Gridley Bar and Chucking Automatics, 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • Limit, Motor Starter and Control Station Switches • Solenoids • Contract Manufacturing.

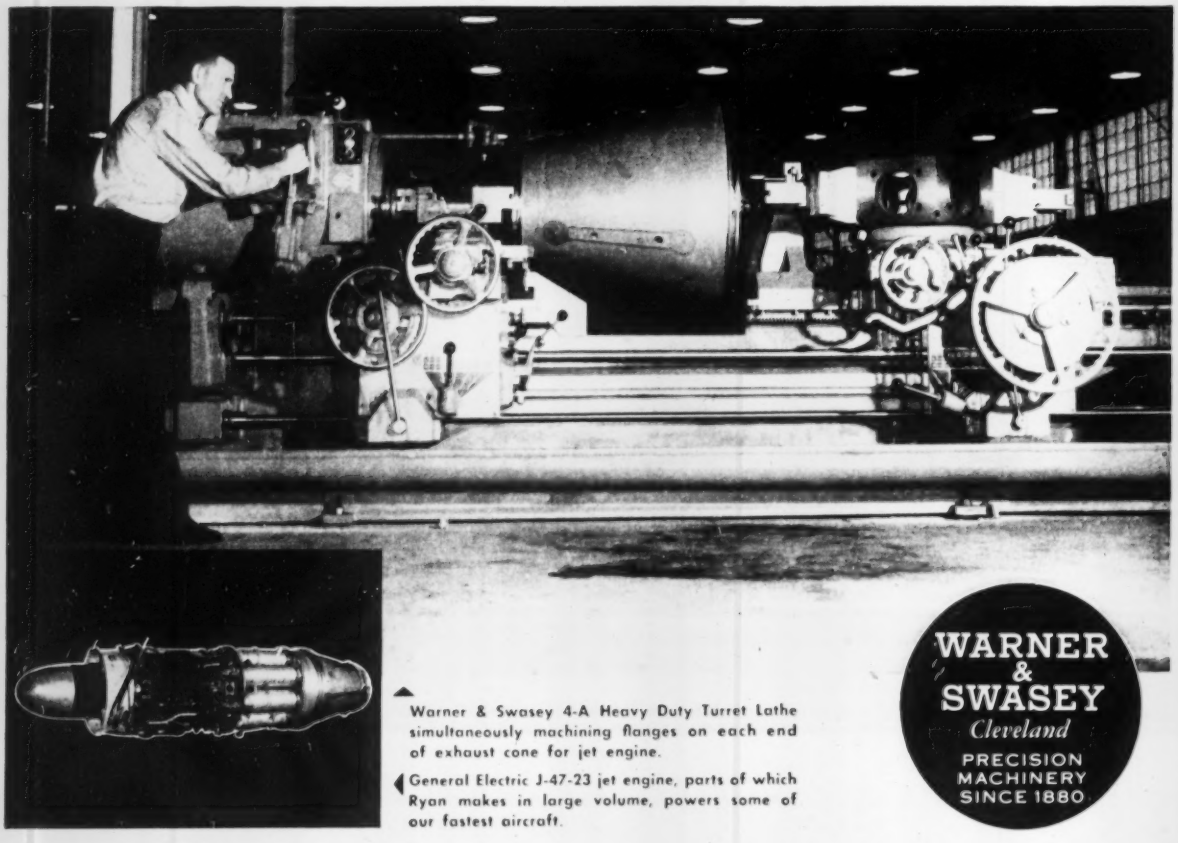
How machining time was cut in half on vital jet engine part

FROM RYAN AERONAUTICAL COMPANY comes this report. They recently installed the first of six modified Warner & Swasey 4-A Heavy Duty Turret Lathes to handle one important phase of production on jet engine components. In addition to slashing machining time in half, this new machine eliminated one complete setup, did away with storage problems, and drastically reduced handling.

This Warner & Swasey was especially designed with special tools and tool holders to machine the flanges on each end of the jet engine's big heavy-gauge, stainless steel exhaust cone. Prior to its installation, Ryan had to set up and machine the flanges on one end of each of a dozen cones, then store the cones around a machine until the new tooling setup was completed and the other ends of the cones machined.

Now, with the Warner & Swasey, the flanges on both ends are machined simultaneously. Cutting tools turn and form the flanges in one pass to 50 micro-inch smoothness. Only one setup is required for each cone, and as its flanges are machined, it is sent on down the production line. Scarce floor space is saved, and handling minimized.

Here is another example of how a Warner & Swasey Field Engineer, working with a company's production men, helped apply Warner & Swasey experience and "know how" to solve a tough production problem.



▲ Warner & Swasey 4-A Heavy Duty Turret Lathe simultaneously machining flanges on each end of exhaust cone for jet engine.

◀ General Electric J-47-23 jet engine, parts of which Ryan makes in large volume, powers some of our fastest aircraft.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Superior

TYPE 430

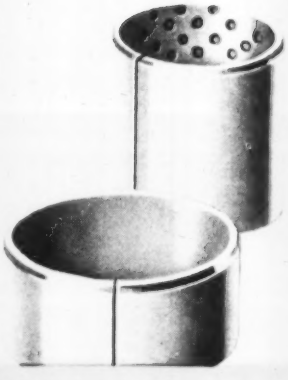
STAINLESS STEEL

FOR HEAT RESISTANCE
RESISTANCE TO CORROSION
EASE OF FABRICATION
UNIFORM HIGH QUALITY

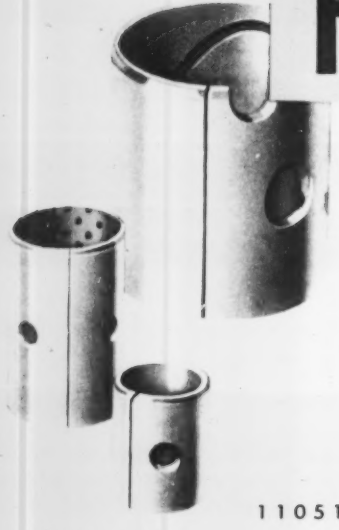
The Heart of the Lighter

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

You get bearing performance at rolled bushing costs with our Bimetal Bushings. Wide variety of diameters, lengths, lining alloys, on steel backs. Write today.



FEDERAL-MOGUL



Products of our six plants include: Sleeve bearings in all designs and sizes; cast bronze bushings; rolled split-type bushings; bimetal rolled bushings; washers; spacer tubes; precision bronze parts and bronze bars.

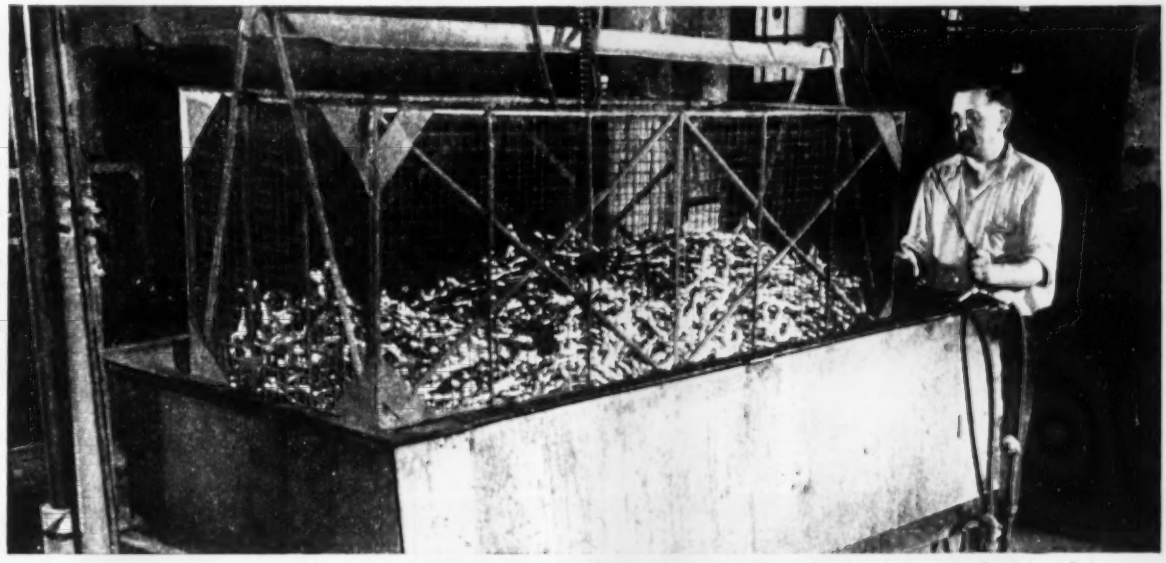
FEDERAL Mogul

SINCE 1899

FEDERAL-MOGUL CORPORATION

11051 SHOEMAKER • DETROIT 13, MICHIGAN

A MODERN VAPOR DEGREASING SOLVENT TO MEET TODAY'S REQUIREMENTS



A typical vapor degreasing installation where thousands of small parts are cleaned in seconds with "Triclene" D.

DU PONT "TRICLENE" D

(TRICHLORETHYLENE)

boosts production . . . cuts costs

Throughout the year, thousands of reports from Du Pont specialists in the vapor degreasing field are studied and evaluated by our research department. This intimate contact with the modern demands of industry has helped guide us in the formulation of "Triclene" D . . . assures you of a rugged solvent that meets modern requirements.

"Triclene" D is stable and pure . . . resists the action of destructive materials which may be present in degreasing. It's the product of over twenty years of research and technical "know-how" in the field. And every drum of "Triclene" D is backed by the Du Pont service organization—experienced men who can help you maintain peak efficiency in every phase of your metal cleaning program.

E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Dept., Wilmington 98, Del.

THIS VALUABLE INFORMATION IS YOURS—FREE

You will find complete information on the operation and maintenance of vapor degreasing equipment in the free booklets offered by the Electrochemicals Department. And interesting, up-to-date case histories about degreasing units in operation throughout the metal field are presented in the quarterly publication "MODERN METAL FINISHING." You can have this wealth of information by checking the appropriate boxes in the coupon below and returning it to us. Get your copies early.

DU PONT
first in solvents for
VAPOR DEGREASING

DU PONT — BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Dept., Wilmington 98, Del.

Please send me more information on vapor degreasing and "Triclene" D. I am interested in receiving the literature checked below.

- ☐ Free booklets on vapor degreasing
- ☐ Free quarterly publication "MODERN METAL FINISHING" (Please add my name to the mailing list)

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An Open Letter of Thanks to V.I.P.*

H. D. PAXSON, PRESIDENT
THEDA L. PAXSON SEC.-TREAS.

PHONE 3486
P. O. Box 214

PAXSON MACHINE COMPANY

Engineers and Builders of
COLD ROLLED STRIP-MILL EQUIPMENT
Specializing in Slitting Lines
SALEM, OHIO

Users of Paxson Equipment
Coast to Coast
U. S. A.

Dear Customers:

Thanks to you "VERY IMPORTANT PEOPLE" for giving us the users' point of view in developing Paxson Slitting Equipment.

You, the actual users, are the ones who really engineered and designed Paxson Slitting Lines.

The combined knowledge, ideas and suggestions of slitting men in plants large and small have guided us in developing custom built lines that best meet your specific needs.

For the utmost in modern efficiency and economical operations, users rely on us for both general and heavy duty lines.

Now, more than ever, it truly can be said:
"PAXSON GIVES YOU THE EDGE".

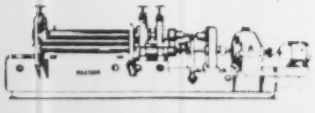
Appreciatively yours,

PAXSON MACHINE COMPANY

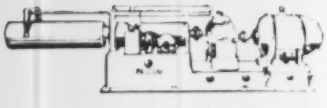
H. D. Paxson, President

HDP/t

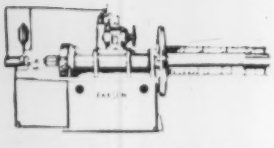
"PAXSON GIVES YOU THE EDGE"



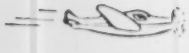
SLITTERS



COILERS



PAY-OFF REELS



Do You Fly?

2800 ft. E.W. runway and club house, private field 2 miles west of Salem, maintained for your convenience. Wire or phone arrival time. We will meet your plane.

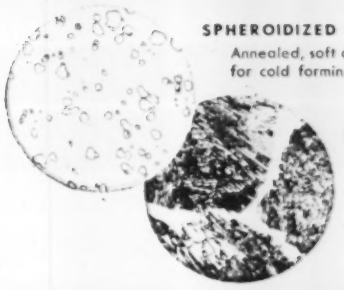
6

PAXSON MACHINE CO.

SALEM • OHIO

Engineers and Builders of Cold-Rolled Strip-Mill Equipment SPECIALIZING IN SLITTING LINES

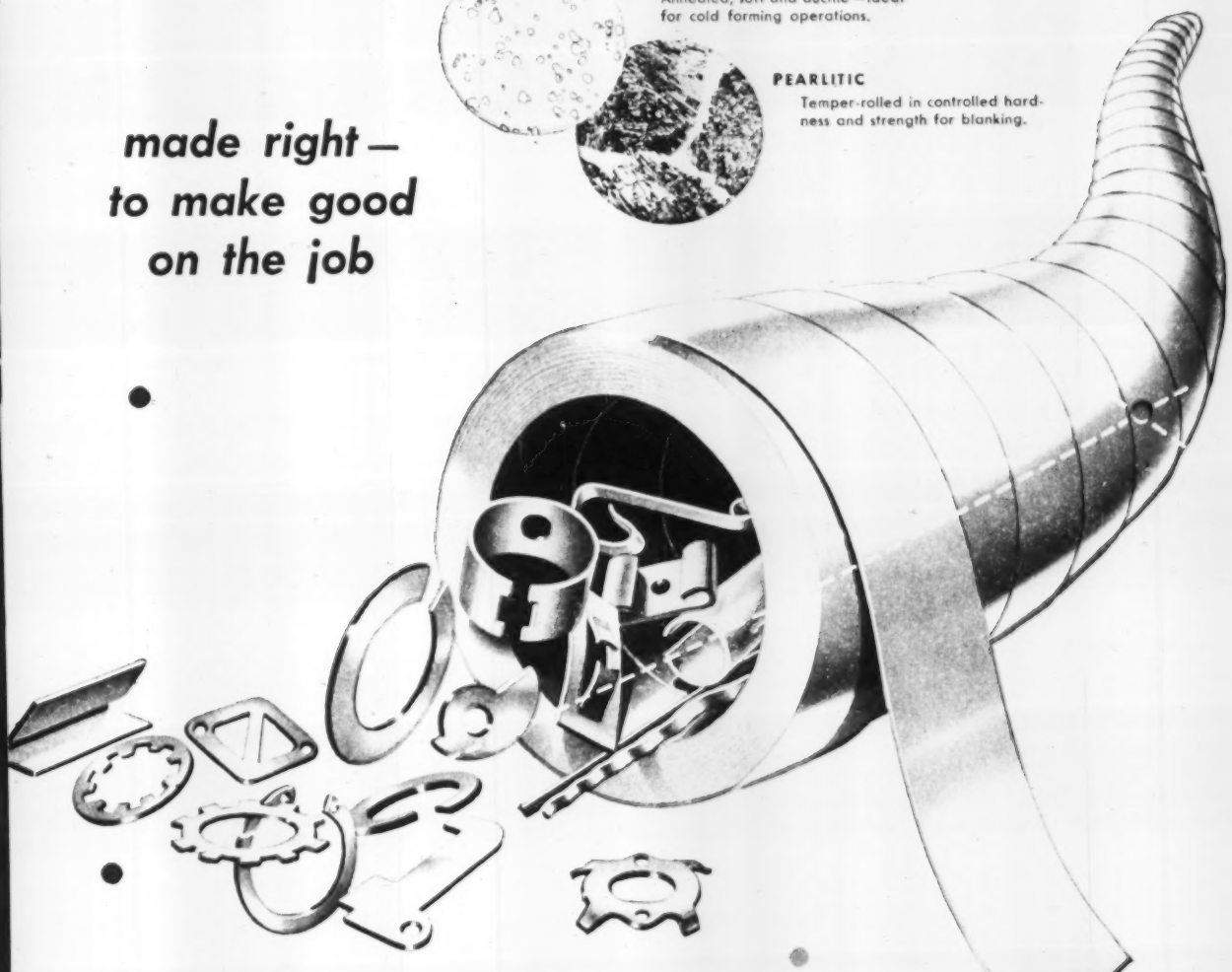
REMEMBER, ALL PAXSON LINES ARE CUSTOM BUILT



SPHEROIDIZED
Annealed, soft and ductile—ideal for cold forming operations.

PEARLITIC
Temper-rolled in controlled hardness and strength for blanking.

made right—
to make good
on the job



WEIRTON HIGH-CARBON STRIP COLD-ROLLED SPRING STEEL

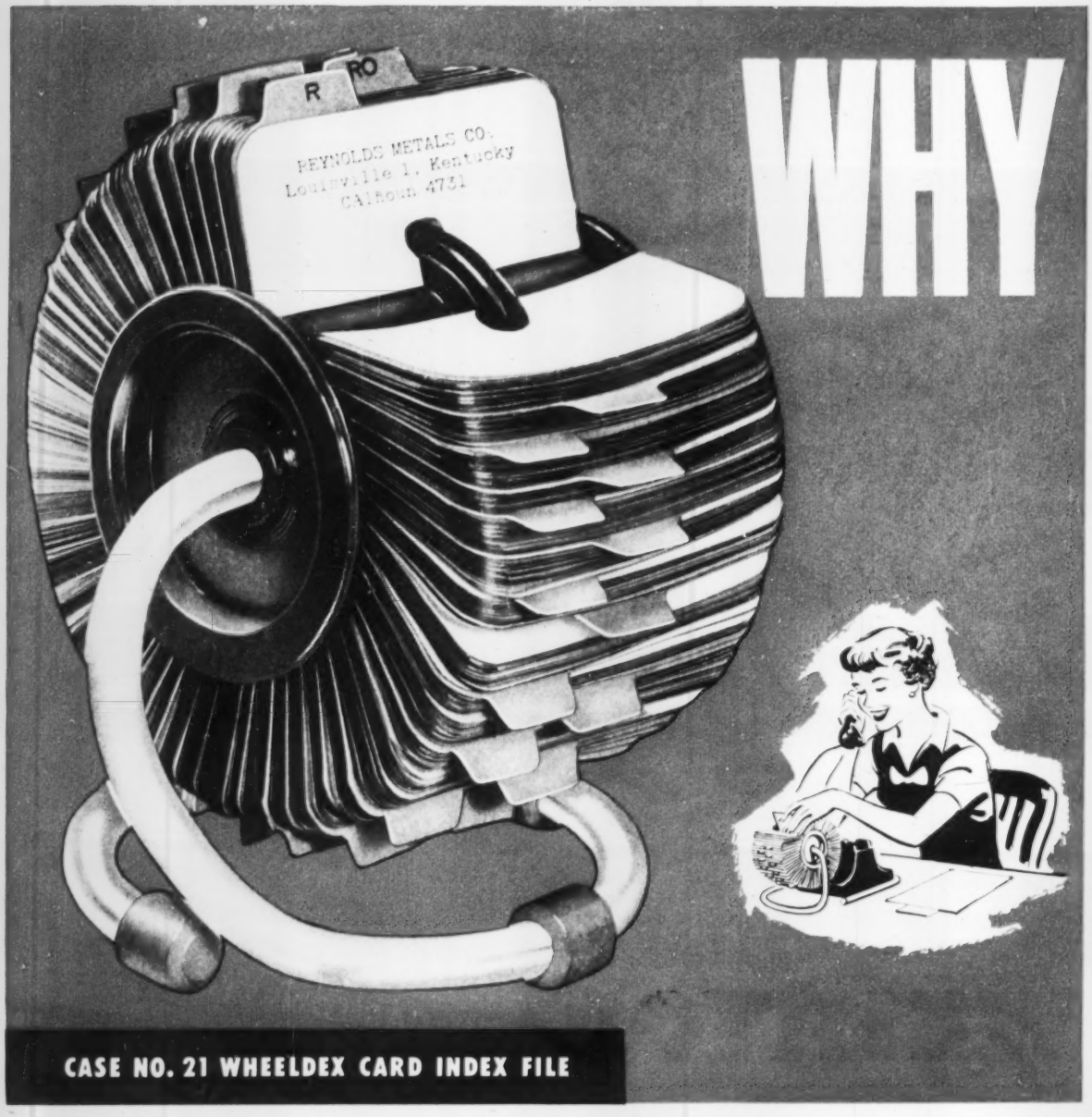
There is a Weirton cold-rolled spring steel that is just right for forming . . . and another exactly right for blanking. Whichever you use, you will find that it makes the operation easier, and meets the requirements for many products in which high fatigue resistance is essential.

Weirton High-Carbon Strip possesses, to an unusual degree, these highly desirable properties and qualities: Accurate response to heat treatment. • Uniformity of gauge and width. • Uniform chemical and physical properties. • Exact constancy of grain structure. • Controlled decarburization limits.

Weirton High-Carbon Strip is obtainable with the desired chemical analysis and for specific heat treating and hardness ranges, in widths up to seven inches.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION



A switch to aluminum tubing *slashed 60% from the cost* of the base for this Wheeldex "Circle Base Cub" card index file.

Another metal was formerly used in this Wheeldex model. Approximately 2,000 pounds made only 3,000 bases. A wise switch to aluminum and now—2,000 pounds makes 9,000 bases, *3 times as many!*

Thus aluminum greatly reduces raw material cost per base unit. Furthermore, the former metal required buffing and chrome plating. By anodizing aluminum after a bright dip, these time-consuming, cost-building plating operations are completely eliminated! Sales figures show the beautiful anodized aluminum finish is proving highly effective in increasing eye-appeal and buy-appeal . . . and at a much lower cost! Add to these benefits, the fact that aluminum tubing is easier to form and you have another important "plus" for aluminum.

This proof of performance with aluminum as illustrated in the progressive design thinking of Wheeldex Manufacturing Company, White Plains, New York, may suggest a similar conversion from other material to aluminum in your operation. Dollar savings plus high corrosion resistance, bright, long-lasting finishes are yours with aluminum.

LET ALUMINUM SERVE YOU, TOO

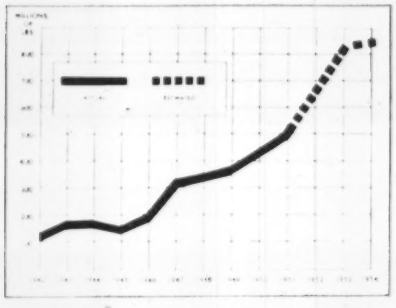
ALUMINUM?

...because it has an ideal combination of advantages found in no other metal!

More aluminum is being specified in designs today because aluminum improves products and increases sales. Let Reynolds Aluminum Specialists help your designers and engineers get maximum benefits from this modern metal. Remember, only aluminum gives you . . .

- **Lightweight with great strength**
- **Consistently low cost**
  no more now than before World War II
- **Natural resistance to rust and corrosion**
- **Attractive appearance**
- **Ease of fabrication by modern methods**

STILL MORE ALUMINUM COMING



The expanding primary aluminum production of Reynolds Metals Company . . . a historic chapter in the company's 33 years of continuing growth. And primary supplies of aluminum ore will be ample for generations.

To the man in charge of production

Acquaint yourself with accepted techniques for fabricating aluminum. Write on your letterhead for aluminum fabrication books listed at right. On special problems consult with Reynolds staff of aluminum specialists. Reynolds Metals Company, 2520 South Third Street, Louisville 1, Kentucky.

Yours For The Asking . . .
REYNOLDS TECHNICAL BOOKS

(please request on business letterhead)*

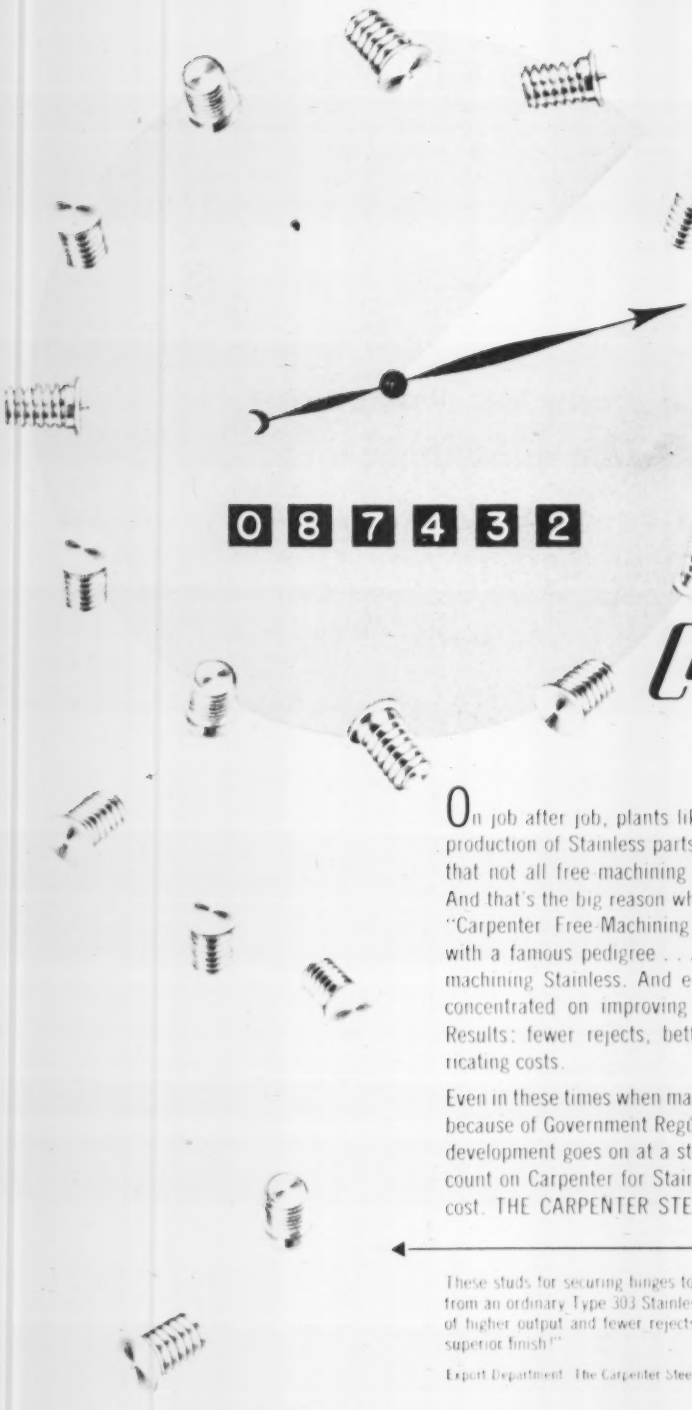
- Aluminum Data Book
  (Aluminum Alloys and Mill Products)
- Aluminum Structural Design
- Designing with Aluminum Extrusions
- Fastening Methods for Aluminum
- Finishes for Aluminum
- Forming Aluminum
- Heat Treating Aluminum Alloys
- Machining Aluminum Alloys
- Welding Aluminum
- Metals Weight Slide Rule

Complete index of all technical literature and films on aluminum design and fabrication also available.

**Instructors in technical schools are also invited to take advantage of these educational aids.*

Be sure to see "Mister Peepers" every Sunday night, 7:30 EST, NBC-TV; hear "Fibber McGee and Molly" every Tuesday night, 9:30 EST & PST, NBC.

REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

You can run a job in less time when you use *Carpenter* stainless!

On job after job, plants like yours have found the secret of faster, trouble-free production of Stainless parts. The job shown here is an example. Again, it proves that not all free-machining stainless steels of the same type number are alike. And that's the big reason why more and more specifications come through marked "Carpenter Free-Machining Stainless." For Carpenter Stainless comes to you with a famous pedigree . . . it originates in the Mill that invented the first free-machining Stainless. And ever since, this same pioneering leadership has been concentrated on improving the workability and uniformity of stainless steels. Results: fewer rejects, better finishes, higher spindle speeds, reasonable fabricating costs.

Even in these times when many nickel-bearing grades of stainless may be hard to get because of Government Regulations, Carpenter's program of stainless research and development goes on at a steady pace. Now and in the future you can continue to count on Carpenter for Stainless you can use to run a job in less time, at a lower cost. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

These studs for securing hinges to dishwashers were turned out faster when the change was made from an ordinary Type 303 Stainless to Carpenter No. 8, Type 303. The customer reports: "Because of higher output and fewer rejects we can produce each stud at a 25% saving . . . and get a far superior finish!"

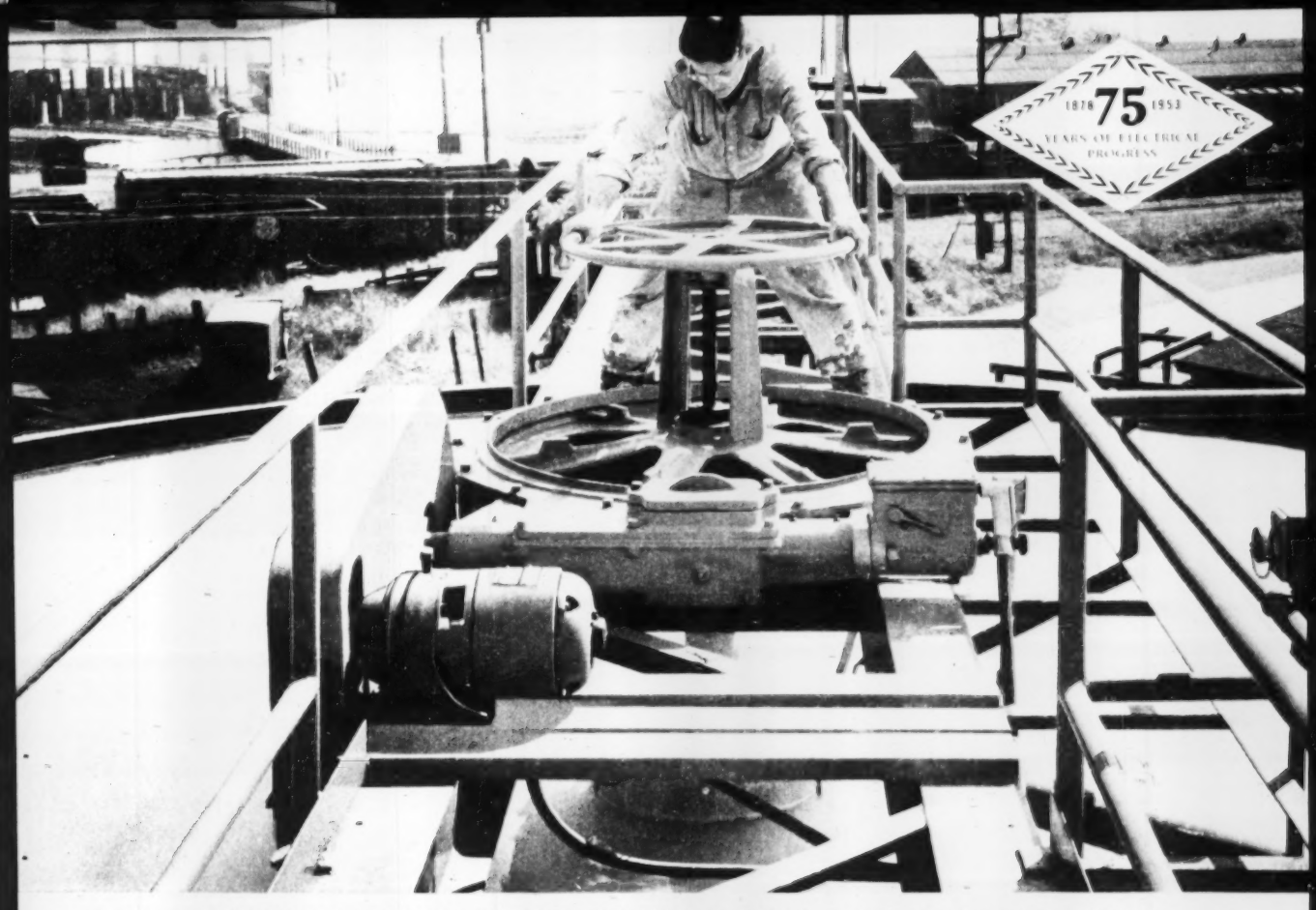
Export Department: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

Free-Machining Stainless

takes the problems out of production

Call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor



THIS G-E GEAR-MOTOR WAS PICKED TO RUN A SLUDGE ACCUMULATOR 24 HOURS A DAY AND 7 DAYS A WEEK BECAUSE . . .

New G-E Gear-motor Reduces "Down-time"

Easy stator removal, use of Tri-Clad* motors, cuts maintenance costs and time more than 50%.

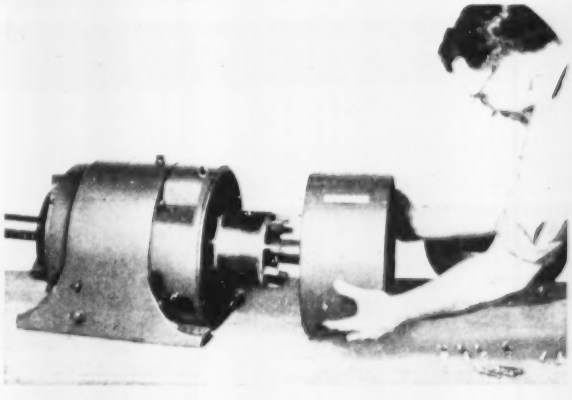
G-E Gear-motors are single units—compact and efficient—the most economical method of gear reduction for low-speed drives. This year, they have been redesigned to offer you additional operating economy.

EASY STATOR REMOVAL is now possible without disturbing the gear-train in any way. Also, any standard G-E motor—with or without feet—may be used as a stator replacement. These advantages mean a reduction of non-productive "down-time"—and substantial cost savings!

TRI-CLAD MOTORS are now an integral part of every G-E Gear-motor. These are the same motors which have gained such a wide acceptance throughout industry—the motors which assure you of extra reliability—triple protection against physical damage, electrical breakdown, and operating wear and tear.

A new stocking plan keeps most popular ratings available on a 1-week basis. You can order your gear-motor from your nearest G-E Apparatus Sales Office or your Authorized G-E Agent or Distributor. General Electric Company, Schenectady 5, N. Y. 35-10

Registered Trade-mark of General Electric Company



Rabbet fit between stator and gear-motor frame assures positive realignment. Note that stator removal is simply a matter of removing a few bolts—can be done without disturbing gear-train.

GENERAL ELECTRIC

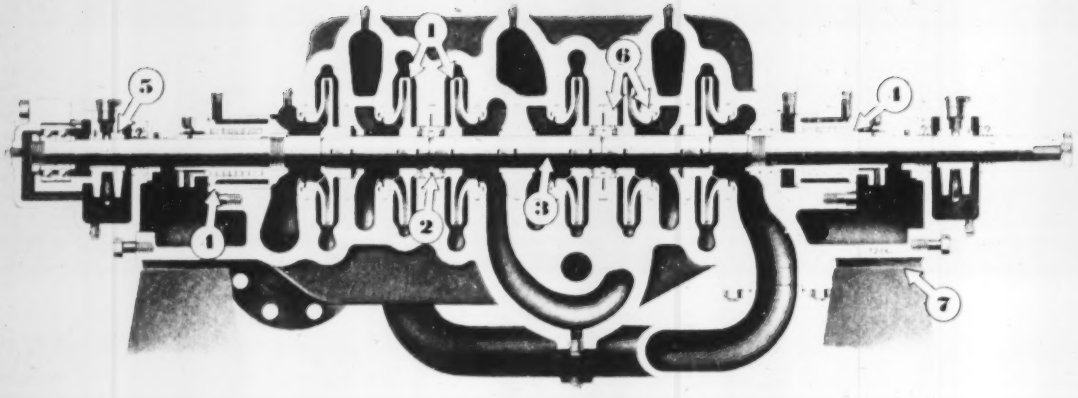
Simplicity, long life, easy maintenance

CAPACITIES TO 1000 GPM

PRESSURES TO 1200 PSI

TEMPERATURES TO 350-400F

1. Opposed impellers balance axial thrust.
2. Impeller mounting provides leak-proof shaft sealing between stages.
3. Exposed shaft insures freedom from distortion.
4. Removable stuffing boxes permit flexibility in shaft sealing arrangement.
5. Split sleeve radial bearings are standard.
6. Positive interstage wearing ring seals eliminate leakage.
7. Casing support insures coupling alignment.



You get them all with...

DE LAVAL

OPPELLER PUMPS

Look at the seven outstanding features shown in the cross-section and you'll see why De Laval Boiler Feed Pumps stay on the job for years... trim maintenance costs. Suitable materials are available for all water conditions. Write today for bulletin giving full application and specification data.

DE LAVAL *Boiler Feed Pumps*

DE LAVAL STEAM TURBINE COMPANY

860 Nottingham Way, Trenton 2, New Jersey

DL 148

We can learn from bankrupt Micawber

"MY advice, Copperfield, you know. Annual income twenty pounds, annual expenditure nineteen-nineteen-six, result happiness. Annual income twenty pounds, annual expenditure twenty-ought-six, result misery. The blossom is blighted, the leaf is withered—in short you are forever floored. As I am!"

This is probably the most famous financial counsel in all English literature, offered a hundred years ago by Charles Dickens' character the bankrupt Micawber to the hero David Copperfield. As advice it is just as good in 1953 as it was in 1849, and just as sound for a nation as for an individual.

In 17 of the last 20 years, Uncle Sam has followed Micawber's practice, not his advice. Our national balance sheet has been, figuratively, "annual income twenty pounds, annual expenditure twenty-ought-six". Ahead of us as a nation, if we continue this irresponsible policy, is Micawber's dire predicament, "blossom blighted, leaf withered—forever floored".

There is no sane reason why the world's richest nation should continue to live the financial life of a profligate bankrupt. It is time now to set our house in order. The program called for is simple: (1) Eliminate waste and extravagance in government spending; (2) Balance the Federal budget; (3) Control the national debt and reduce taxes.

By such positive action we can protect future happiness—and prevent misery—for ourselves, our children and our children's children.

QUALITY YOUNGSTOWN SERVICE

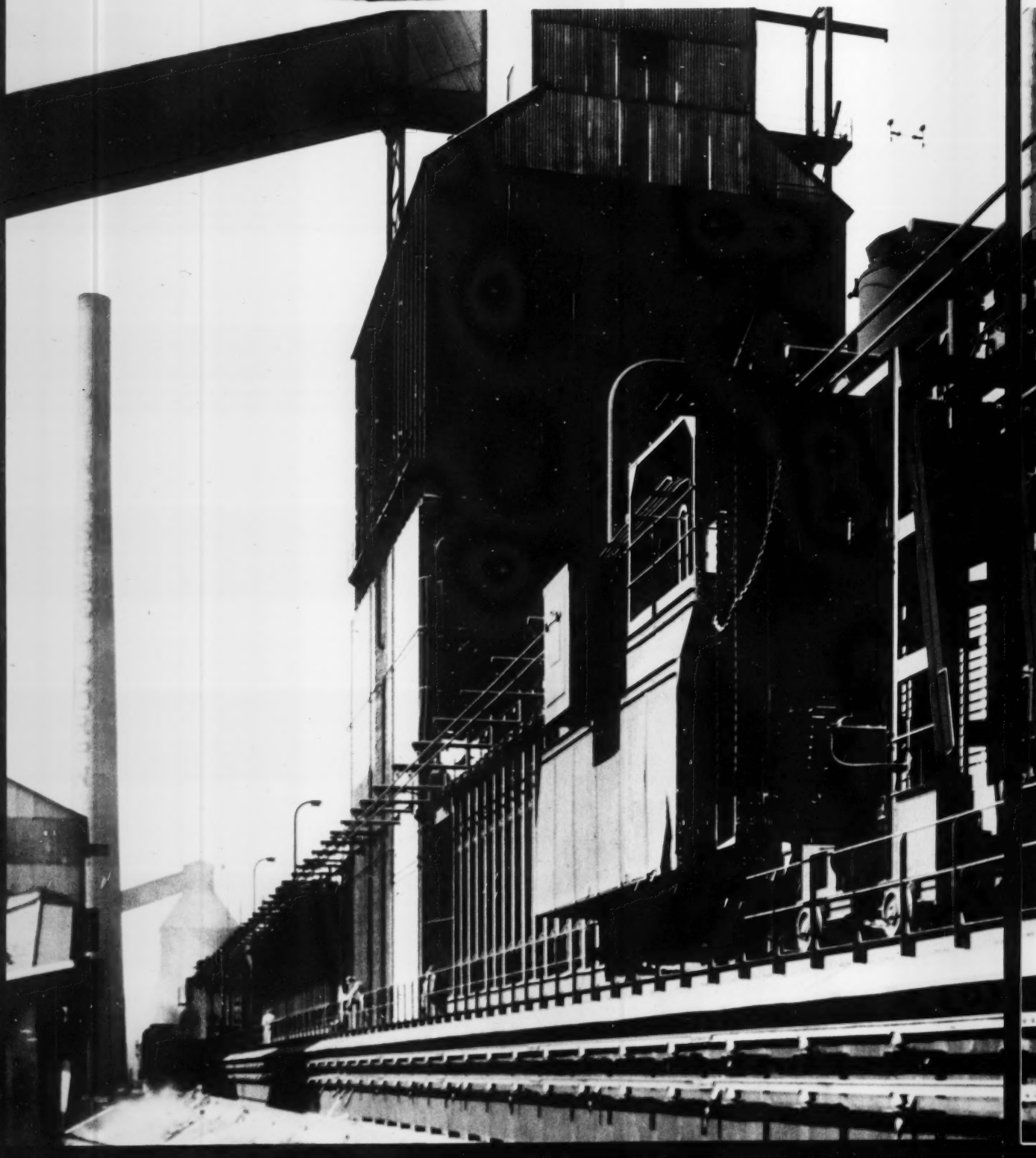
The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York

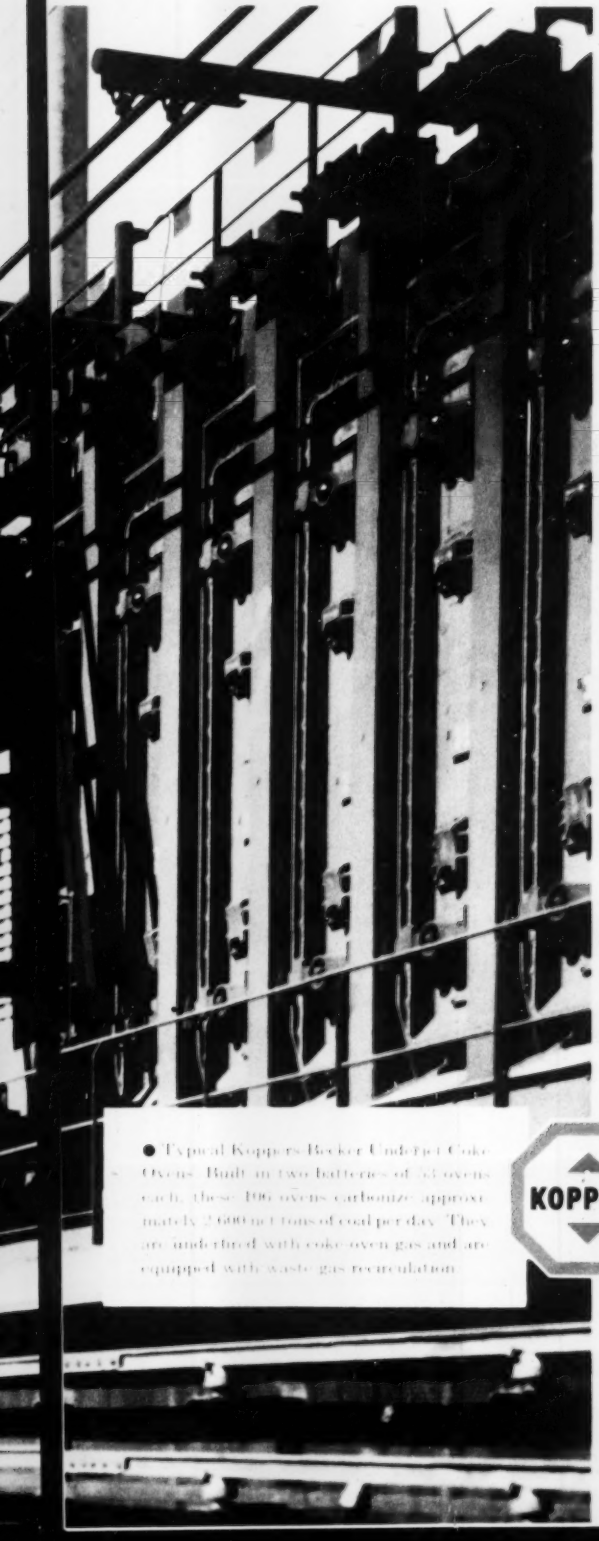
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.

A B C's of



good coke-oven construction



● Typical Koppers-Becker Underjet Coke Ovens. Built in two batteries of 53 ovens each, these 106 ovens carbonize approximately 2,600 net tons of coal per day. They are underfired with coke-oven gas and are equipped with waste-gas recirculation.

A good basic design

The efficiency of any coke oven hinges entirely on its design. We believe that Koppers-Becker Coke Ovens have the best basic design. As a result, these ovens are sturdy, free from complications, simple to control. They also have the largest practical coking capacity.

This basic design meets diversified conditions. It can be employed when heating by any kind of fuel gas normally available, when building large or small ovens. This design results in low maintenance and in long life.

B constant engineering refinements

Koppers builds a great many coke-oven plants and is therefore in a position to anticipate new needs. For example, the waste-gas recirculation system was developed by us to meet the need for uniform heating when using rich fuel gas.

C skilled engineering staff

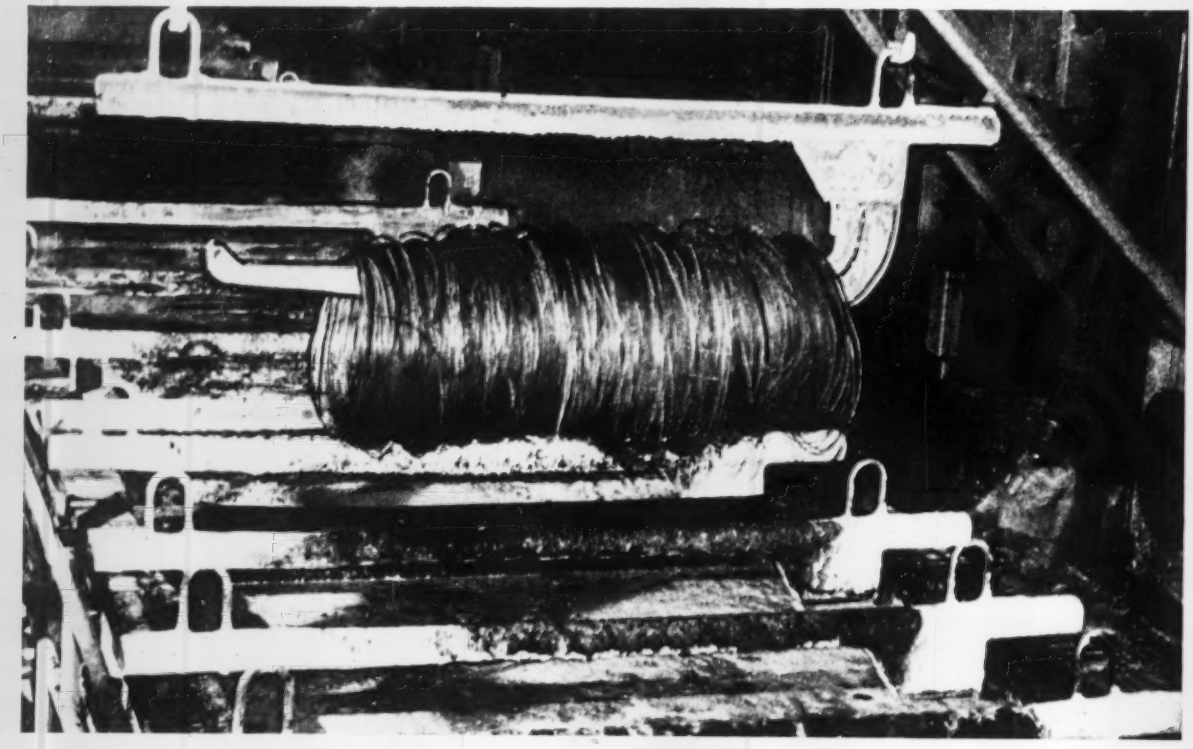
There is no substitute for a skilled engineering staff. Through the years, our engineers have proved their ability to design and erect the most advanced and efficient coal carbonization equipment . . . material-handling systems . . . gas-treatment equipment.

Constructing coke ovens and related equipment is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers. You are invited to consult with our Engineers and Management.

KOPPERS

Engineering and Construction Division

KOPPERS COMPANY, INC., PITTSBURGH 19, PA.



33⅓% LONGER LIFE and still going strong

. . . Monel pickling hooks for trouble-free operations

The pickling hooks previously used at Jones and Laughlin's Aliquippa Works had been failing after an average of three years in service.

Naturally, this added to the cost of operation. So the plant men decided to search for a material that would remedy the situation.

They tried several metals in both cast and fabricated form. But all of them failed in pickling coiled steel wire in an 8% solution of sulphuric acid at a temperature of 160 F.

Then they tried wrought Monel® hooks and found the solution to their problem. It was over four years ago that they installed 37 Monel hooks fabricated by Youngstown Welding & Engineering Co. And at a recent inspection not one showed any signs of corrosion although the double thickness iron pipe to which the hooks were welded had been reduced ½" in diameter by the fumes.

The plant men discovered a second advantage in using Monel too

The cast material previously used sometimes cracked or broke off when a hook accidentally caught on a rack Monel merely bent and could be straightened and put back in service.

Monel equipment can help you increase the efficiency of your own pickling room, too. Monel crates, racks, hooks, and accessories are used by many of the nation's leading plants to give increased payloads and longer service life.

Consult your Distributor of Inco Nickel Alloys for the latest information on their availability from warehouse and mill. Remember, too it always helps to anticipate your requirements well in advance.

Inco's Technical Service Department is always glad to help you with your material problems. Why not write today, and ask for your free copy of "5-way savings . . . in Pickling."

THE INTERNATIONAL NICKEL COMPANY, INC., *67 Wall Street, New York 5, N. Y.*

MONEL . . . for minimum maintenance

INCO

STEEL

The Metalworking Outlook

February 9, 1953

It's Better To Wait

About 160 different industries—many of them metalworking—have in the works with OPS a study to determine if they're entitled to increased prices under the industry earnings standard. Few of those studies will be continued now. Even if they were, they probably wouldn't be completed by Apr. 30. If you had planned to ask for a study—so you could pass along the recent increases in castings prices, for example—you might as well forget it and wait until Apr. 30 or when your industry is decontrolled.

About Machine Tools

Small companies are increasing their complaints about distribution of government-owned machine tools. Since assuming control of those idle machine tools on May 12, 1952, the NPA Production Equipment Central Inventory Group has listed more than 34,000 tools. The center has allocated a total of 10,477 and issued shipping instructions for only 3197 in a program to lease equipment to direct military and defense-supporting contractors . . . Machine tool builders already see signs of a recession in their industry and have made tax recommendations to Congress' Joint Internal Revenue Committee for a reform in depreciation laws . . . Machine tool and other machinery prices may be decontrolled next week (p. 60).

Not When, But How

The big question in Congress now on controls is not when they'll go, but how. At issue is the question of standby controls. Sen. Homer Capehart (Rep., Ind.) wants standby and his S. Res. 42 asks that a study be made. But Senate Republican Leader Taft is opposed to the idea. "I don't think we should give legal recognition to the principle of controls," he says. Probable outcome: Some type of standby authority, but in a watered-down version.

Reform in Contracting?

The Senate Judiciary Committee has approved S. 24, the bill sponsored by Sen. Pat McCarran (Dem., Nev.) to permit judicial review of many disputes about government contracts. A Supreme Court ruling in November, 1951, had made the government contracting officer's word final in matters not involving fraud. The measure, if passed, would limit those individuals' authority, long considered too broad by many business men.

New Look for the Seaway

The St. Lawrence Seaway project, after being tossed about for some 50 years, has come up in Congress with a new look. Seventeen senators and representatives are sponsoring legislation to set up a St. Lawrence Seaway Development Corp., financed by self-liquidating bond issues to construct a canal on U. S. ground at the 46-mile International Rapids section of the river. Dropping the power project

Production Engineering News p. 87 The Market Outlook p. 155

would cut the cost to $100 million, compared with last year's estimate of $566 million for the combination seaway-power project. The hydro-electric part would be left to New York state and Ontario province.

Lobbying Act: Dead

The Federal Lobbying Act is virtually dead. Federal Judge Alexander Hotzoff ruled that it's unenforceable because the penalty the law imposes for its violation is unconstitutional. At present about 850 persons and organizations are registered in Washington as lobbyists, many of them representing metalworking industries.

Good Business for 1953

Manufacturers' sales for 1953 should match but probably not greatly exceed the $276.5 billion registered for 1952. Business in 1953 will be excellent, especially during the first half. One cloud on the horizon is rapidly rising inventories, notably in durable goods which rose $1.3 billion in 1952 to $24.1 billion at the year's end. Nondurables dropped $650 million to total $19.5 billion at yearend.

Product Design: How Often?

The emphasis on sales that's appearing for 1953 brings up the old question: Will increased sales justify the expense of yearly changes in a product's design? The answer evolving thus far seems to be no to yearly changes unless they're decidedly minor, but yes to biennial modifications.

Straws in the Wind

Completion of an alltime high of 46,988 oil wells in the U. S. for 1953 is forecast by *World Oil* . . . Kaiser Steel Corp. is considering a $52 million expansion program at Fontana, Calif . . . Solid fuels furnished more than 80 per cent of the heat used in the U. S. during 1935, but only 43 per cent in 1951, while the combined contribution of gas and oil rose from 19 per cent to almost 54 per cent . . . Harlow H. Curtice now is president of General Motors Corp.

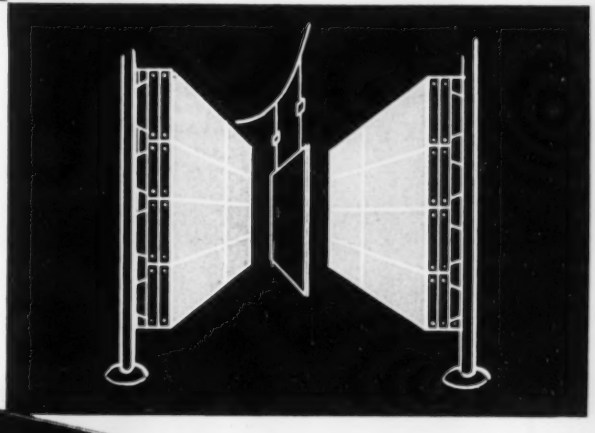
What Industry Is Doing

Inventory and delivery positions for steel, copper and aluminum are on the mend—a STEEL survey shows (p. 59) . . . Walter Reuther may postpone his demands for wage adjustments in the automotive industry, now that Mr. Eisenhower will retain for another six months the Bureau of Labor Statistics' old consumers' price index (p. 60) . . . Eastern railroads will receive about $40 million annually from the new division on East and South freight revenues (p. 61) . . . Scientific and development research outlays hit $3.5 billion in 1952 (p. 62) . . . Makers of lubricating equipment in 1953 hope to equal last year's sales volume (p. 63) . . . Accurate gaging of markets will be even more a mangement-must in the hard-selling days ahead (p. 70).

Armco ALUMINIZED Steel solved this reflector problem

Heating panels for intense infra-red radiant heat need reflectors that are efficient, long-lived and rugged. A prominent manufacturer of electric radiant panel units has found that Armco ALUMINIZED Steel meets all of these requirements.

His reflectors operate on a wave length of 4 microns at 900 degrees F. Even at this temperature the aluminum coating stays bright. It maintains its reflective efficiency because of its resistance to oxidation, and protects the steel base.



the steel base means strength

In addition to their excellent heat-reflectivity, panels made of Armco ALUMINIZED Steel assure rugged strength. Corrugations in the steel give rigidity to "take" hard knocks and vibration at the 900-degree F reflector operating temperature.

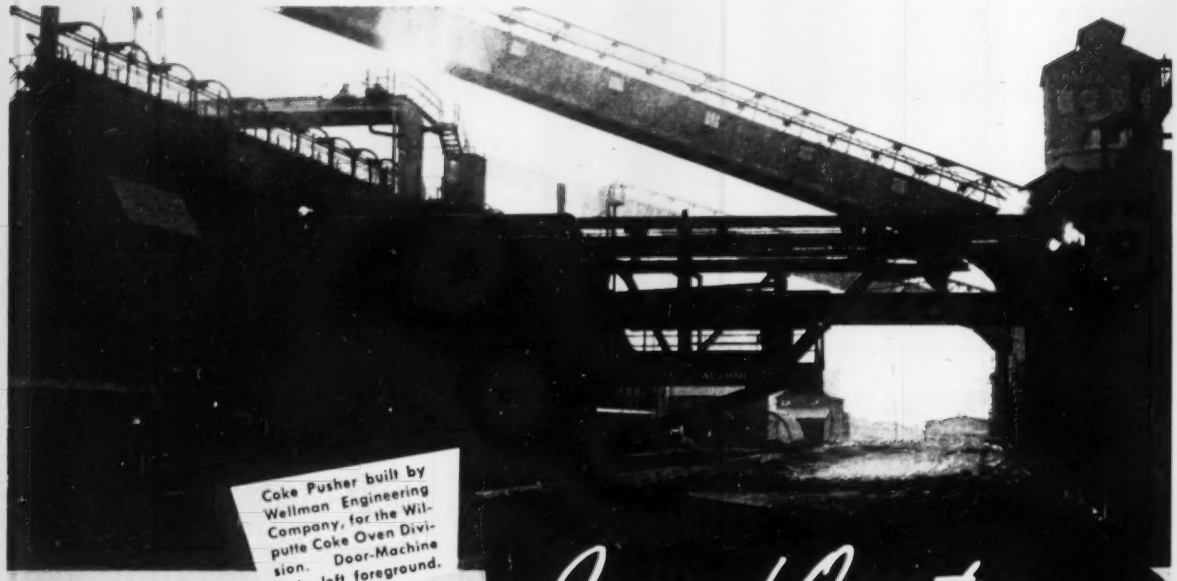
proved in service

Armco ALUMINIZED Steel is used for its heat reflectivity, and resistance to a combination of heat and corrosion. Applications include automotive tail-pipes and mufflers, furnace combustion chambers, oven liners for kitchen ranges and electric toaster inner parts. The grade is produced in sheets and coils 12 through 30 gage—up to 48 inches wide in certain gages.

write us

If you need a heat-reflective or heat-resistant metal, write us for the descriptive booklet, Armco ALUMINIZED Steel.

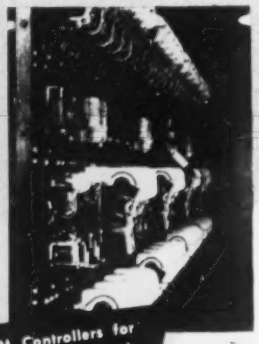
ARMCO
STEEL CORPORATION
1523 Curtis St., Middletown, Ohio • Export: The Armco International Corporation



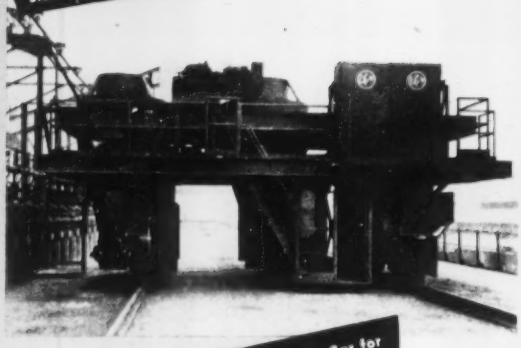
Coke Pusher built by Wellman Engineering Company, for the Wilputte Coke Oven Division. Door-Machine is in left foreground.

Improved Operation

A GOOD REASON FOR SPECIFYING EC&M CONTROL FOR COKE OVENS



EC&M Controllers for automatically operating four car-hauls at the Coke Screening Station.



Koppers Larry Car for charging coal into ovens.

These coke oven machines are operated by EC&M Controllers using EC&M LINE ARC Magnetic Contactors and EC&M TIME-CURRENT method of acceleration.

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Forthright Objectives

Many policies outlined in President Eisenhower's State of the Union message are based upon two fundamental premises one relating specifically to foreign affairs and the other dealing with government administration generally.

The key to foreign policy lies in these terse sentences: "We have learned that the free world cannot indefinitely remain in a posture of paralyzed tension, leaving forever to the aggressor the choice of time and place and means to cause greatest hurt to us at least cost to himself. This administration has, therefore, begun the definition of a new, positive foreign policy."

This means that the President is determined that the free nations shall take the initiative in the cold war. One step in this direction is the decision that the "Seventh Fleet no longer be employed to shield Communist China." Another is the President's intention to ask Congress for legislation making it clear that the United States does not recognize any secret understandings of the past which purchased favors for us at the expense of enslavement of any people.

The second fundamental premise is found in the statement that "the people have an elementary right to a government whose clear qualities are loyalty, security, efficiency, economy and integrity." These qualities are reflected in all of the President's proposals. They stand out in his decision to abandon futile government controls, to adopt sounder fiscal policies, to reduce federal expenditures as a prelude to lowering taxes, to amend the labor law and restore true collective bargaining, to unify the armed services in fact as well as in name, to seek a new approach to the problem of farm prices and to broaden assistance to those who really need it.

It will be noted that the new President is retaining some of the best policies of the Roosevelt-Truman regime while discarding some of its worst. Probably the most significant difference between the programs of the old and new administrations is in the definition of objectives.

Eisenhower's is positive, clear and forthright. Truman's was wavering, fuzzy and confusing. The former are essential to the inspiring leadership for which Americans have been waiting.

E. L. Shaner

EDITOR IN CHIEF

A BENEFICIAL SHIFT: TV fans last Monday witnessed operations on an automobile axle assembly line. It was a defense job. The narrator asked the works manager how many shifts were working on the job. He replied that only one shift was working because the company could not obtain enough workers to man a second shift. Newspaper want-ads con-

firm this statement. Tens of thousands of jobs are going begging.

The next night TV and radio listeners were told that several thousand federal employees in wage and price control agencies were notified that their services would not be required after Mar. 2. To lose a job is always tough, but to lose it when jobs are plentiful is better than to lose it when jobs are scarce. Conditions today are favorable to a shift from unnecessary federal work to urgently needed work in private industry. The adjustment will be beneficial to employees and taxpayers.

HOW TO HANDLE RUSSIA: Late in January, President Eisenhower nominated Gen. Walter Bedell Smith as under-secretary of the State Department. The nomination is significant. Smith has worked very closely with the President. He was ambassador to Russia after World War II. As No. 2 man to John Foster Dulles, he will be the executive who carries out the chief's orders.

For these and other reasons, his views on the Russian problem carry weight. Last Wednesday when he was being questioned by members of the Senate Foreign Relations Committee, he quoted the following statement by Lord Palmerston, British statesman in Queen Victoria's reign: "It's always the policy and practice of the Russian government to expand its frontiers as rapidly as the apathy and timidity of its neighbors permit, but to halt or recoil when met with determined opposition."

This appraisal of a half-century ago is pertinent today. In many ways the traits of Soviet dictators are similar to those of the czars.

MAIN ASSET — RESEARCH: According to a survey conducted by the Defense department's Research and Development Board and the Labor department's Bureau of Labor Statistics, the nation's expenditure for scientific research and development in 1952 (p. 62) totaled more than $3.5 billion. Two-thirds of this amount was for work performed in facilities owned or operated by private industry, but about half of the cost was financed by the federal government, mainly by the Defense department and by the Atomic Energy Commission.

These figures are encouraging in one way but definitely disconcerting in another. Research is one of our outstanding national assets. It should be expanded and refined to the limit of our capabilities. However, we should strive for a better balance between participation by government agencies and private industry. Particularly, private enterprise should be given greater opportunities in the development of atomic energy.

CUTTING SPEED LIMITS: In an informative discussion of how to determine proper cutting speeds by analyzing cost-controlling factors (p. 88), Hans Ernst, director of research of Cincinnati Milling Machine Co., brings up an interesting question and provides a partial answer. He says that some investigators have urged the use of cutting speeds much higher than those now used in commercial practice. They have a theory that just beyond presently used speeds lies a Valley of Death which, if we only had the courage to cross, would lead to a Promised Land of almost everlasting tool life. Is this true or false?

The author reports that investigations have been made to explore the region of very high speeds on various types of steel and cast iron. Thus far, in tests involving speeds up to about 14,000 fpm, no such Valley of Death has been discovered.

JAIL IS LESSER EVIL: That was an odd plight in which the 13 second-string communist leaders found themselves in federal court in New York last Monday. Convicted of revolutionary conspiracy under the Smith Act, they appeared before Federal Judge Edward J. Dimock for sentence. In a discourse, in which he admitted he was "thinking out loud," he hinted of a hypothetical arrangement whereby the defendants might be offered the alternative of going to Russia instead of serving their jail sentences and paying their fines in America.

They rejected the idea instantly, furiously and emphatically and on Tuesday Judge Dimock sentenced them to jail terms ranging from one to three years and to the payment of fines from $2000 to $6000. Before their conviction, they were extolling the blessings of life in Russia. Offered a chance to enjoy those "blessings," they rejected them in favor of life in a "capitalistic" prison. This is a perfect example on communistic duplicity.

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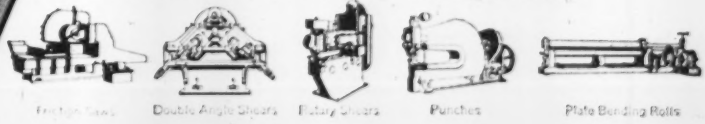

612

For Special Operations in Steel Mills...

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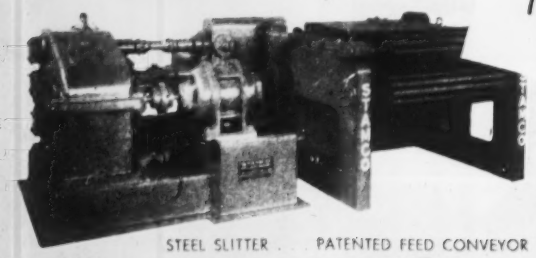
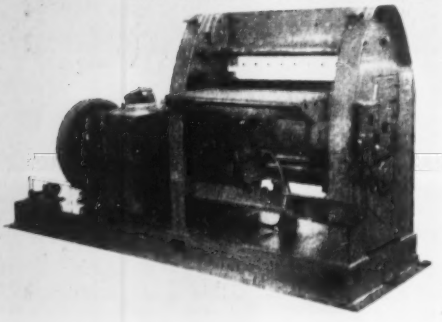
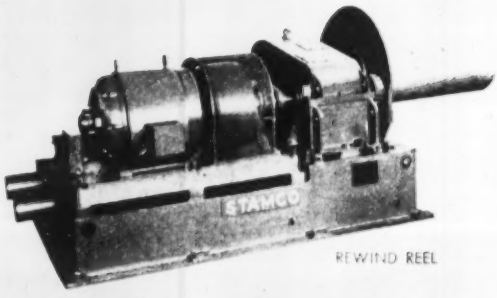


STEEL SLITTER . . . PATENTED FEED CONVEYOR



UP-CUT SHEAR



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Steel, Copper, Aluminum Inventories and Deliveries Improve

Figures Are Percentages of Those Replying

STEEL QUARTERLY SURVEY	INVENTORY POSITION					BEST DELIVERY				
	Under 10 Days	10-30 Days	30-60 Days	60-90 Days	90-180 Days	Under 10 Days	10-30 Days	30-60 Days	60-90 Days	90-180 Days
H. R. carbon bars, over 1"	2.6	31.6	42.1	13.2	10.5	11.8	29.4	8.8	14.7	35.3
H. R. carbon bars, under 1"		20.5	50.2	17.6	11.7	19.4	38.6	9.7	12.9	19.4
H. R. alloy bars	6.4	20.1	60.3	6.6	6.6	23.1	7.7	15.4	7.7	46.1
C. F. bars, over 1"		35.3	58.9	5.8		30.7	30.8	15.4	7.7	15.4
C. F. bars, under 1"		35.7	35.7	28.6		35.4	36.1	21.4	7.1	
H. R. sheets, strip	5.7	37.1	45.7	8.6	2.9	11.8	14.7	14.7	17.6	41.2
C. R. sheets, strip	5.9	29.4	47.0	11.8	5.9	11.7	10.8	12.8	35.3	29.4
Gal. sheets	18.1	26.3	28.3	9.1	18.2	41.6	8.4	16.8	24.8	8.4
Plates, light	3.1	12.5	62.5	15.6	6.3	16.8	23.4	3.3	26.7	28.8
Plates, heavy		17.6	55.9	14.7	11.8	6.5	25.8	12.9	19.4	35.4
Structural shapes		35.7	26.1	23.9	14.3	3.7	25.9	11.1	22.2	37.1
Manufacturers' wire		36.3	45.4	9.1	9.2		44.5	11.0	11.2	33.3
Welded tubing	5.6	11.1	33.2	44.5	5.6	13.1	33.4	13.3	21.1	19.1
Seamless tubing	19.9	26.1	20.4	27.9	5.7	6.3	43.7	12.5	18.8	18.7
Stainless sheets, strip	24.7	25.4	41.6	8.3		9.9	20.1	31.2	20.0	18.8
Pig iron (foundry)		31.2	56.3	6.3	6.2	5.8	64.7	17.7	6.6	5.2
Copper, brass mill prod.		44.1	44.9	11.1		33.3	44.5	11.1	11.1	
Aluminum products	9.8	20.2	61.1	8.9		30.1	30.2	11.6	20.1	8.0
Copper wire, cable		19.0	60.8	20.2		19.6	20.4	41.1	18.9	

Midyear Supply-Demand Balance?

INVENTORY and delivery positions in steel, copper and aluminum are on the mend.

Some 65 per cent of the cross section of metal users replying to STEEL's quarterly survey report their ideal inventory position now would be in the 30-60 day category. A glance at the accompanying survey results reveals that for most of the 19 products more companies have stocks in that "ideal" group than in any other category. Nearly 80 per cent of the respondents also expect delivery dates to improve steadily over the next three months.

Good, but—Comments by metal consumers reveal that many now think a balance between supply and demand is at least in sight, although it's not quite here yet. As one man put it, "I don't expect to have a single worry about materials supply by summer. That's fortunate because I think I'm going to have many worries about sales." Another says: "I predict mill salesmen will be calling on me for orders soon—for the first time in about a decade."

Of course, not all is serene in all quarters. A small fabricator says, "The situation in carbon bars has never been worse." An auto supplier complains: "Our inventory level today is the lowest since before World War II." But those comments are exceptions. Most of the trouble seems to be among smaller or newer companies—who have had little chance to build up historical positions with mills or warehouses—and automotive firms which are now pulling all stops to help push car production to record levels.

Illegal—Many executives candidly admit that their inventories are beyond the legal limits set by NPA. "We can't operate economically unless they are," one purchasing agent for a tank fabricator says.

Others point out that industry was even more flagrantly illegal on inventories early last summer before the steel strike. "And it was a good thing we were, too," says a screw machine products maker. "We never would have survived if we hadn't been." Even NPA says

the inventory restrictions usually are ignored.

The Why of Delivery—The survey results indicate a wide range of delivery times for nearly all steel, copper and aluminum products. One steel producer points out that the CMP setup artificially extends some deliveries. "Do away with CMP and all that paperwork," says the sales manager for that company, "and you'll see a 15-30 day improvement for many products."

Tight Products—Hot and cold-rolled carbon sheet and strip is getting tighter, the survey reveals, chiefly because of the heavy demand from Detroit. Bar supplies are not as stringent as expected, and inventories of those products are surprisingly high. Plate and structural inventories are also improving steadily.

Among nonferrous products, aluminum sheets and extruded shapes and copper wire and bronze shafting are giving consumers trouble.

Regular Buying — More than 83 per cent of the respondents do not now use gray market, conversion, foreign or other extracurricular sources for their metal. Many indicate that they did resort to such practices after World War II.

The consensus among steel consumers is that the minor gray market that sprang up in mid-1950 is now virtually gone, that conversion and exchange deals are still common, but waning rapidly, and that a supply-demand balance is possible by next summer.

Prices: They Won't Boil Over

As the price lid goes, industrial prices can be expected to remain quiet, although scattered increases will occur for a while

THE END of price controls will cause only a mild ripple in metalworking's price levels.

No across-the-board changes will occur in steel, although you can expect adjustments among scattered products. Copper and aluminum quotations will also remain steady. The changes in the myriad of products made from those and other metals should not be great. A STEEL survey of 1152 executives reveals that 70.7 per cent of them are selling metalworking products at below OPS ceilings already.

The Reason Why — General industrial prices will remain about steady because more normal competition is returning. The preceding story on inventories and deliveries of steel, copper and aluminum supports that.

So, the price situation made last week's debate seem largely academic to industrialists as to whether price and wage controls should be lifted now or Apr. 30. For practical purposes, controls are dead now, even if the official death notices are scattered out over the next seven weeks. The lids on small appliances were removed last week; big appliances will be freed soon; then industrial items.

Matter of Time—President Eisenhower in his State of the Union message last Monday also advocated the end of materials controls. Here, the end will be more gradual than with prices and wages. As it looks now, a little CMP for the military, atomic energy and a few other program will be kept. Controls on scarce items such as nickel will be retained.

But beginning in the second quarter, CMP will probably be open-ended on many products, then dropped completely by July 1 for all but those special programs. Even military allocations may be lower from now on than they have been. The military has already turned back some allotments for the first and second quarters because of a new Budget bureau directive that limits cash disbursements per quarter.

The Third Front — In another area of defense mobilization, President Eisenhower wants to merge the Office of Defense Mobilization, Defense Production Administration and National Security Resources Board into one organization. Congress is amenable, but as of late last week the problem was to find a man to head the combined office.

As a preliminary step, DPA was merged into ODM Feb. 1.

New Life for BLS Index

Continuation of the old index may thwart the UAW's plan to reopen contract talks now

FAVORABLE ACTION on President Eisenhower's request that the Bureau of Labor Statistics continue compilation of the Old Series Consumer's Price Index for six months longer has thrown a hot

WALTER REUTHER
. . . juggling a hot potato

potato into the lap of the United Auto Workers' Walter Reuther.

Mr. Reuther had passed the boiling spud to the automotive companies when he indicated the UAW would not accept automatic changeover to the new BLS index (for more on that, see STEEL, Jan. 12, p. 42). With this wedge, the union also wanted to open discussions on a raise in base pay of 20 cents, a boost of $20 in maximum pensions, a 1 cent raise to a total of 5 cents in the annual improvement factor and the elimination of compulsory retirement.

Agreed Already — Automakers say the mechanics for the transition from the old to the new index are already spelled out. "If agreement on the changeover cannot be made in the six month period," says a spokesman for one auto company, "perhaps Congress will continue the life of the old index until it can be done or until all contracts

based on the old index expire."

Should the union decide on a battle of attrition to force a reopening of contract talks, it will find the political climate greatly changed from that of eight or nine months ago. Slow downs and similar actions, which have been used before to reopen talks, are now on shaky legal ground and the unfair labor practice provisions of the Taft-Hartley act loom constantly in the background.

Sole Purpose—BLS will continue to publish the new Consumer's Price Index and it will be the official index of the federal government. The old series index will be issued solely for the purpose "of meeting the needs of certain labor unions and business concerns which have contracts based on it."

But at least the old computation will continue for six more months. Industry is hoping that Mr. Reuther will hold off on any serious trouble at least that long.

Grant DTA Industry Loans

The Defense Transport Administration has recommended defense loans totaling $8,839,293 for transportation industries under its jurisdiction. As of Dec. 31, 1952, 17 loans were granted by the Reconstruction Finance Corp. to DTA industries after their consideration and recommendation by DTA and the Defense Production Administration. Of those loans, 14 went to motor carriers.

At the beginning of 1953, 113 loan applications had been received by DTA at a dollar value of $92,145,982. Aside from loans granted or awaiting consideration, 65 applications valued at $19,441,801 had been denied and 21 applications requesting $15,562,276 were withdrawn by applicants.

U. S. Leads World Tankers

The American privately-owned ocean-going tanker fleet declined slightly in the last year but remains the largest in the world under one national flag, the National Federation of American Shipping reports. The federation states that our tankship fleet totals 447 units of 6,743,000 deadweight tons, a drop of 10 ships and 64,000 tons since Jan. 1, 1952.

Freight revenue may increase for eastern roads as . . .

ICC Adjusts South, East Freight Formulas

A NEW Interstate Commerce Commission formula will divide freight revenues on shipments between the East and South to give increased revenue of about $40 million to eastern railroads. In accepting the formula, ICC ruled that southern lines were receiving more than a "fair and equitable" share of earnings. Money return from freight handled jointly will be placed on a straight mileage basis, effective Apr. 1, 1953.

The revision of dividing revenues handled jointly by two or more railroads in different geographical sections eliminates a bonus which lines in the South and Southwest have enjoyed for 13 years. As their over-all volume trailed that of eastern lines, and operating costs were somewhat higher, southern and southwestern railroads received an extra amount.

Increased Industry — ICC says these factors no longer apply because of vast industrial expansion and population increases in the South and Southwest. In addition, the commission believes progress made by southern railroads makes a bonus unnecessary to put them on an equal basis.

This action by ICC doesn't change rates or affect shippers. It leaves unaffected the present formula for dividing revenue on coal and coke shipments moving between eastern and southern railroads.

Railroads Benefit—Three eastern lines will receive most of the benefit from the new ruling, ICC indicates. These include the New York Central, Pennsylvania and the Baltimore & Ohio railroad companies.

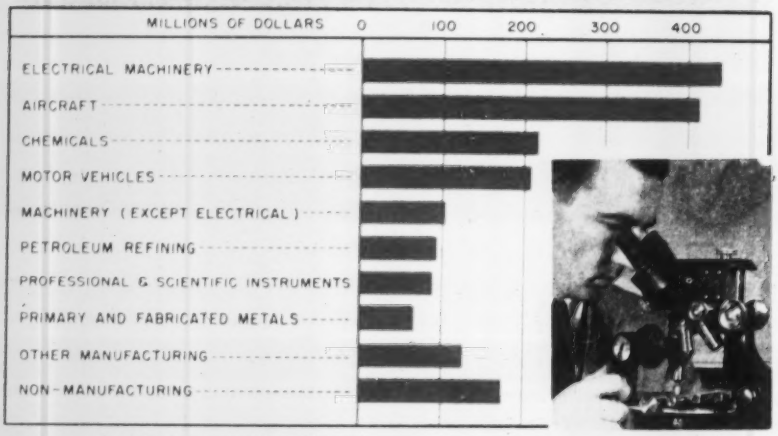
River Belt: Bottleneck Solution?

Cleveland may solve an irksome Cuyahoga river bottleneck by construction of a proposed overhead rubber conveyor belt. The belt would bypass the congested, twisting river to carry ore and limestone from the harbor to steel mills two or three miles upstream.

Engineers of B. F. Goodrich Co., Akron, say a four and one-half mile belt road 42 inches wide could be built in a year for about $6 million. Dock and loading facilities and rights of way might bring total costs to $10 million. Planners believe the belt could handle about 20 million tons of ore and limestone annually.

Criticism has not been felt from other transportation interests which blocked a more ambitious plan to build an overhead conveyor to carry raw materials from harbors at Lorain, O., and Cleveland to Youngstown and the Ohio river. That idea is before Ohio Legislators for the third time.

COST OF RESEARCH BY INDUSTRY 1951*



* Preliminary Reports, Bureau of Labor Statistics.

Industry Spurs Research Programs

Government survey shows research and development programs rose to an outlay of $3.5 billion in 1952. Private industry fills the bulk of the work

SCIENTIFIC RESEARCH and development in private industry is a multibillion-dollar business.

According to first reports from a national survey conducted by the Defense department's Research and Development Board and the Labor department's Bureau of Labor Statistics, the national outlay for such research totaled more than $3.5 billion in 1952. The estimated figure is based on 1951 reports. Two-thirds of this amount was for work performed in facilities owned or operated by private industry.

Growing Importance — The government says its survey, covering about 85 per cent of all industrial research and development in 1951, indicates a fourfold increase in research and development expenses within the past decade. Almost half of industry's reported research was financed by the government, mainly by the Defense department and Atomic Energy Commission.

Research expense in 1951 for companies reporting to the survey made up 2 per cent of their total sales or services. The highest proportion, 13 per cent, occurred in aircraft manufacturing. Electrical machinery and professional and scientific instruments industries devoted 6 per cent of sales and services to research. Both electrical machinery and aircraft manufacturing industries spent more than $400 million on research, as shown by the chart above.

Expensive Engineers — Average research outlay per engineer or scientist was $22,100, with a range from $16,500 in the chemical industry to a towering $68,600 in motor vehicle manufacturing. With such an investment, companies are closely watching the rate at which engineers leave for armed services or other positions. Firms reporting to the survey lost an average of 16.4 per 100 engineers in 1951. Military service calls caused only one-fifth of the separations, but industry now fears increased inroads.

Accumulated effects of draft calls could hamper research under full mobilization, but industry is confident that it could increase its program, if necessary. Some 70 per cent of reporting companies replied that they were willing to take on new defense research contracts.

Manpower — Companies included in the survey employed 94,000 research engineers and scientists. They were supported by about 140,000 technicians and administrative and maintenance personnel. Supporting employees, like their fellow workers, were concentrated in relatively few companies with large research programs.

A conclusion of this preliminary report is that more information should be made available concerning private industry's widespread research activities. Increasing importance of those programs makes it necessary to know more about industry's resources for research.

DuPont To Make More Titanium

Expansion of titanium sponge producing facilities is under way at Du Pont de Nemours & Co. Inc.'s Newport, Del., plant, and will begin soon at the company's plant in Edge Moor, Del.

Six buildings, including a main manufacturing building and a power house, will be erected at the Newport site. Construction at Edge Moor will consist mainly of additions to existing structures.

The expansion, undertaken at the government's request, will yield an estimated 13,500 additional tons of titanium sponge within five years.

Three Advisers Named

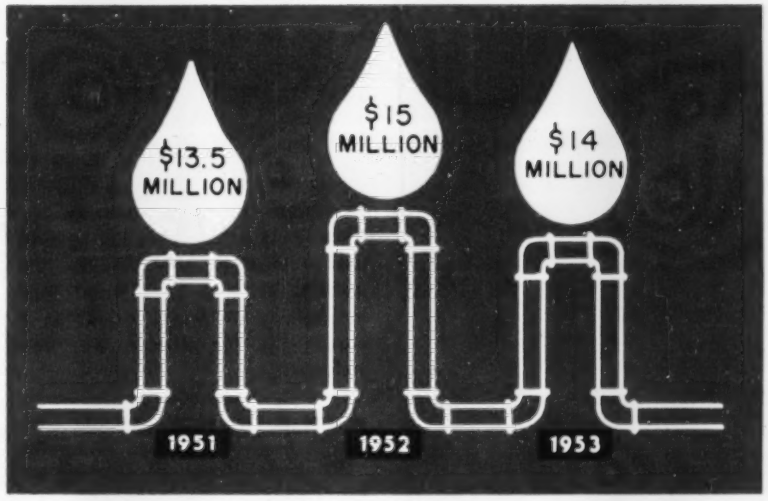
New members of the board of advisers, Industrial College of the Armed Forces, Washington, are William M. Allen, president, Boeing Airplane Co., Seattle; Alexander R. Heron, vice president, Crown-Zellerbach Corp., San Francisco and Mark E. Andrews, Houston.

Pole Line Hardware Dips

Pole line hardware makers report that they have the capacity to meet present defense and civilian needs and they are prepared for more business. Industry members say the backlog of orders for pole line hardware from military procurement offices and the utilities has declined since 1951, as has production.

Pole line hardware covers all equipment mounted on poles and transmission towers, except for insulators and current-carrying conductors. Manufacturers do business of about $50 million annually for power and communication lines. The industry manufactures about 1000 different items.

Manufacturers expect their equipment production to increase steadily in the future, as a large expansion of electric power generating, transmission and distribution facilities is planned for the next three years.



Estimated by STEEL.

Lubricating Systems: Sales Squirt Up

Manufacturers of lube systems are looking for new fields to conquer as their products gain recognition. Sales this year will slip only slightly from 1952's high levels

CENTRAL LUBRICATING systems, natural companions to faster, high-production machinery, form the liveliest trend in the lubricating equipment industry today. Manufacturers are finding they can no longer depend on a spurt of oil or a dab of grease applied by an unskilled "grease monkey" to keep their production lines rolling with a minimum of down time.

Central lubrication goes a long way toward solving the arch problem of the lubricating engineer — depositing the correct volume of the lubricant at the right time to each individual bearing.

Nub of the Matter—To do that requires an intricate system of pumps, reservoirs, metering devices, timers, filters, tubing and check valves. Around a nub of four major producers, there are about 15 companies which make more or less standard central and mechanical lubricating systems. Other firms tailor such systems in certain cases. Together they did about $15 million in sales last year, up 10 per cent from 1951, and expect to do nearly as well in 1953 (see the chart).

The centralized units are only a further development away from the oil can and grease bucket, however. There are also mechanical units, either hand or automatically operated, which have a central pumping unit but no valves and no metering devices, and oiling and greasing devices which are strictly manual operations. Lubricating system manufacturers tend to concentrate on one type of equipment and to cultivate one type of customer.

Difficult Entree — Altogether about 30 companies produce lubricating systems and they rang up sales of approximately $50 million in 1952. With a tapering in new plant and equipment expenditures, the outlook should be for a drop in sales. But, lubricating system manufacturers insist they will at least equal last year's sales record because many industries are only now becoming educated to systematized oiling and greasing. "We still find the first sale in a plant is a tough one," says one LS maker, "but once we get one installation in a shop, others follow quickly."

Biggest customer of lubricating systems dollarwise is the steel industry. Centralized lubrication was developed for steel plant rolling mills about 25 years ago, but didn't really catch on until 1939 or 1940, says L. O. Witzenburg, sales manager for Farval Corp., Cleveland. Other big customers of lubricating systems are the railroads (it's said the Pennsy alone has a million gallons of car lubrication oil in use all the time), rubber, automotive and mining equipment industries.

The Lighter Side—For the manufacturers of lighter systems, like Bijur Lubricating Corp., New Rochelle Park, N. J., machine tool producers are a major customer. Among Bijur's customers are also business machine makers, packaging machinery, textile machinery and broaching machine makers.

Newer refinements in lubricating equipment include oil-mist lubrication being brought out by Alemite Division of Stewart Warner Corp., Chicago, and a grease pump system which will operate off the hydraulic system already installed on a machine developed by Trabon Engineering Co., Cleveland. But, the primary job of lubricating system manufacturers is that of pioneering in new industries, adapting existing lubricating systems to different types of equipment.

Not Enough Engineers

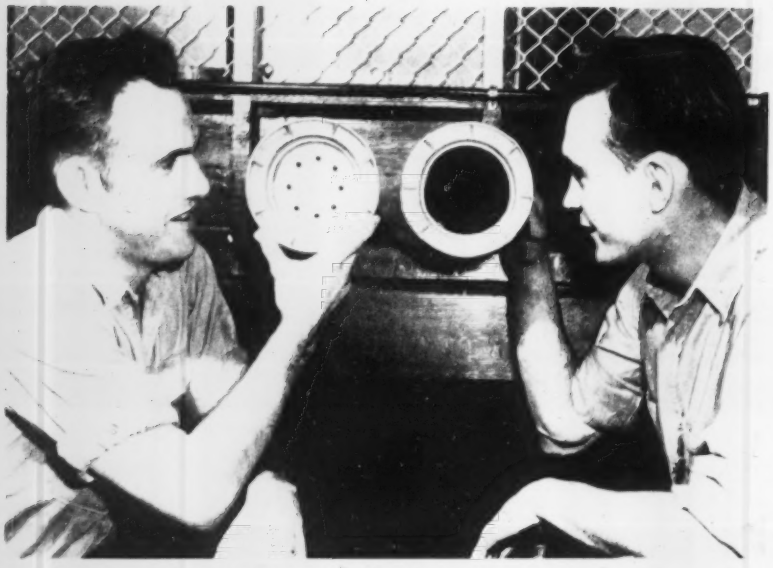
A severe shortage of engineers confronts the nation, but the future is even grimmer, spokesmen of the Engineering Manpower Commission of the Engineers' Joint Council predict. Some 40,000 engineering jobs are vacant, they add, and only 23,000 graduates of engineering schools are expected this year. Of that number, the ROTC will take 6800.

Needing 30,000 new engineers annually, industry expects engineering graduates to number 19,000 in 1954 and 22,000 the following year.

Second Jasper Project

A second project by Cleveland-Cliffs Iron Co., Cleveland, is planned to mine and concentrate Michigan's iron-bearing jasper. First operations in 1951 were to concentrate deposits of hematitic jasper in a joint operation with Ford Motor Co. at Humboldt, Mich. Forecasts are that production at this plant will begin early in 1954.

New plans call for development of low-grade ore at Republic, Mich., open-pit mines. Two concentrating units will be built, each capable of producing 200,000 tons of iron ore concentrates annually.



Suggestion Pays Off for Firestone Workers

A simple perforated plate was worth $900 to Richard L. Prillaman, left, and Harold Archer, employees of Firestone Tire & Rubber Co.'s defense products plant in Akron. They suggested putting such a plate in the ends of 5-inch rocket tubes to reduce the amount of paint lost during the interior painting operation. The idea worked, and they were awarded the cash for the suggestion of the year

Reo Motors Turns to Civilian Work

REO MOTORS Inc. is taking steps so it won't be caught napping by cuts in defense contracts. The Lansing, Mich., company plans a program of diversification which will turn more production into civilian channels.

Since 1945, a relatively small proportion of Reo products have been sold to the civilian market. In 1952 dollar volume reached $150 million, of which two-thirds consisted of military truck contracts. Reo officials predict that these contracts will drop gradually, perhaps drastically.

New Products—Among other activities, Reo will enter the wheel goods business, the production of an inboard engine kit for small boats and activation of a division for production of industrial and marine engines. The company already produces trucks, engines and power lawn mowers for the civilian market.

In entering wheel goods, Reo purchased the trade name, special tooling and manufacturing rights of the Pal Wheel Goods Division of Northern Indiana Steel Supply Co., Michigan City, Ind. Manufacture there will include children's vehicles such as velocipedes.

Company Formed — Within the past month, the company entered another field by forming Reo Truck Leasing Inc., a wholly-owned subsidiary, to enter coast-to-coast truck leasing operations.

Machine Tools Ease

Easing of the supply-demand relation in machine tools is shown in a notice of intent by the NPA Metalworking Equipment Division to eliminate Exhibit D from NPA Order M-41. The change, which will take two to three weeks to finalize, will permit acceptance of unrated orders for the tools in the Exhibit D list and reduce military set-asides of these tools from 70 to 60 per cent of production. Delivery dates on rated orders will be kept intact.

Help for Small Business

Rep. William S. Hill (Rep., Colo.), who is slated to head the House of Representatives' Select Committee on Small Business, says he will place "high on his agenda" the problem of how to give "immediate help" to those small businessmen who might face "bankruptcy" if the Korean war ends suddenly.

RFC Nets $25 Million

Proceeds from Reconstruction Finance Corp.'s production programs and liquidation of wartime activities, amounting to $25 million, brought to $74,784,000 the net total turned over to the Treasury by the RFC in the 1953 fiscal year to date.

Other remittances since July 1, 1952, include $14 million to retire notes payable to the Treasury, $12.3 million as a dividend on the corporation's lending activities and $20 million from production and liquidation proceeds.

The production programs include national security measures for synthetic rubber manufacture, tin smelting and growth of abaca fiber. The liquidation program provides for disposal of assets of certain government corporations created during the 1940-1945 period.

Coke Ovens for Weirton

Weirton Steel Co., Weirton, W. Va., awarded Koppers Co. Inc., Pittsburgh, a contract to design and build a battery of 41 chemical-recovery coke ovens at Weirton.

A belt conveyor system to be built by Koppers will deliver coke from the metallurgical coke screening station to railroad cars on the blast furnace high line. The new ovens will increase Weirton's coal carbonizing capacity by 1000 tons daily.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Lathes	Lodge & Shipley Co., Cincinnati
Shells, Mortar, 81 mm	Conlon Moore Corp., Cicero, Ill.
Bomb, 100 lb	R. G. Le Tourneau Inc., Peoria, Ill.
Primers, Percussion	Harper Wyman Co., Chicago
Fuses	Casco Products Corp., Bridgeport, Conn.
Combat Vehicle Parts	Minneapolis-Honeywell Regulator Co., Minneapolis
Aircraft Test Sets	Airborne Instruments Laboratory Inc., Mineola, N. Y.
Receiver-Transmitters	Magnavox Co., Ft. Wayne, Ind.
Electron Tubes	Radio Corp. of America, New York

Picking Plant Sites

Report tells what to look for in selecting locations for your new industrial facilities

INDUSTRY is often guilty of using slipshod methods when it selects areas for new plants. So says Leonard C. Yaseen, senior partner of Fantus Factory Locating Service, in *Plant Location* (Business Reports Inc., Roslyn, N. Y., pp. 149).

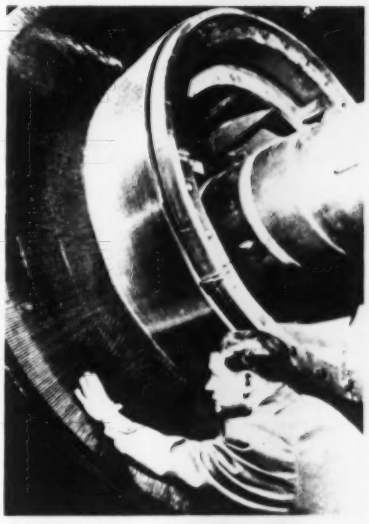
Some manufacturers will even permit hunches to govern their final selection of one plant site over another, says the author. An example is the Tale of Well-fed Executives.

Power of Food—Top officials of a large company were touring the South in quest of a good location for their new plant. Several communities looked good. But the Chamber of Commerce in one city entertained these gentlemen with a splendid chicken dinner. The new plant was built there.

Many a company, however, is not much more scientific in plant designation than were these industrymen who came to dinner. Businessmen often pick a community with good transportation facilities near their present market or source of supply. Up goes the new factory. Instead, these manufacturers should make a thorough study of freight rates, local and state taxes, utilities, potential workforce and other important factors, especially to answer the question: What will this community be like 10 or 25 years from now? *Plant Location* discusses how a manufacturer can make an intelligent estimate of a community's potential.

How It's Done — The author shows how to chart your raw material sources and your market, how to obtain a freight advantage to the market, how to assess the labor market, how to determine labor stability, among other procedures necessary before a certain area is chosen.

Also discussed: Nation-wide variances in local taxes; the supply and cost of power, fuel and water; the effect of climate on industry; ways and means to attract new industries and how to develop promotional programs.



More Power for Steel

This 48-ton armature is in production at the East Pittsburgh, Pa., plant of Westinghouse Electric Corp. Above, it is inspected before shipment for installation in a 5000-horsepower, reversible steel mill motor. The armature in this picture is ten feet high

Texas Invites Industry

Houston survey shows need for new metalworking facilities along the Gulf coast

MORE METALWORKING plants should be located in the Texas Gulf Coast area, according to findings of the Houston Chamber of Commerce. Of 194 manufacturers surveyed in that area, 166 said expanded metalworking facilities would cut their operating costs.

Suggestions — When asked for specific suggestions, 73 plants said more steel producing capacity would help the area, while 14 manufacturers urged that aluminum fabricating plants be located there. Among desirable facilities are aluminum rolling mills, extrusion plants and mills for rolled aluminum products. Nine plants cited a need for local production of brass, bronze and copper materials.

Some 111 of the reporting companies are fabricated metal plants with an aggregate investment of $42 million, while 53 are oil tool plants valued at $52 million. Another 22 companies are foundries with an investment of $7 million, and eight are primary metals plants with a total investment of $209 million. They employ 34,864 workers and plan expansion of $5.3 million during the next two years. Their total sales in 1951 were $698.6 million.

Bright Hopes—The Gulf Coast report, pointing out the importance to the area of the $310.4 million investment by these metal producers, suggests that new industries will take their place in Texas as the market for their products continues its increase.

CHECKLIST ON CONTROLS

Price Regulations

ALUMINUM—Amendment 2 of Supplementary Regulation 113 of General Ceiling Price Regulation, issued and effective Jan. 28, 1953, permits producers of aluminum mill products to determine their new ceiling prices either by adding 9.2 per cent to their GCPR prices or by adding 4 per cent to the prices established under SR 113.

TOYS—Amendment 13 of Revision 1 of General Overriding Regulation 5, issued and effective Jan. 29, 1953, suspends toys and games of all kinds from price controls.

MACHINERY—Amendment 5 of Supplementary Regulation 4 of CPR 30 and Amendment 4 of Supplementary Regulation 8 of CPR 30, both issued and effective Jan. 30, 1953, extend to Feb. 28, 1953, the deadline for manufacturers of machinery and related products, who price by formula, to refile for Capehart adjustments.

CUT TACKS, NAILS—Amendment 32 of General Overriding Regulation 9, issued and effective Feb. 2, 1953 exempts from price control sales of cut tacks and small cut nails. It does not exempt wire tacks, wire nails or wire staples.

MACHINERY—Amendment 6 of Supplementary Regulation 4 of CPR 30, issued Feb. 5, 1953, and effective Feb. 7, permits manufacturers of machinery and related products, including automotive parts, to apply for permission to file separately for Capehart adjustments for any of their production units under autonomous management.

CASTINGS—Amendment 1 of Supplementary Regulation 1 of CPR 60, Amendment 1 of Supplementary Regulation 2 of CPR 60 and Amendment 1 of Supplementary Regulation 3 of CPR 60, all issued and effective Feb. 7, 1953, make it clear that the price increases authorized by these supplementary regulations for castings specified may be applied to ceiling prices in effect on the effective date of each supplementary regulation, including increases previously authorized under other applicable OPS regulations, but not including increases for increased metals costs under General Overriding Regulation 35.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Some Republican leaders dampen hopes for tax reduction. In view of budget deficits, they say tax cuts would drain additional billions from the Treasury

PRESIDENT Eisenhower and some Republican leaders in Congress agree that no tax reduction is possible in the immediate future. Key statistics show why.

The Truman budget for fiscal 1954 envisions a deficit of $9.9 billion, atop a $5.9 billion deficit in the current year. Tax reductions proposed by Chairman Reed of the Ways and Means Committee and backed by the great majority of that committee would cost the Treasury $2.2 billion in fiscal 1954 and $8.5 billion each year thereafter.

Potential Losses — Among the losses would be: Reducing individual income taxes on June 30 would lower the government's revenues at a rate of about $3 billion for each full fiscal year, reducing corporation taxes in April, 1954, would cost $2 billion in a full year, and expiration of the excess profits tax on July 1, 1953, would cause a loss of receipts of $1.3 billion in fiscal 1954.

Inflation is causing sentiment in Congress for a boost in personal income tax exemption. Several bills would increase it from $600 to $1000. An increase of only $100 would cost about $2 billion a year in tax collections.

Rewriting Laws—Tax experts believe that much of the tax trouble can be eased by rewriting the tax code to remove inequities which discourage initiative and are oppressive to small business. To accomplish this, the Treasury has engaged Dan T. Smith of the Harvard School of Business Administration to head a special study staff. His group is to work closely with the Congressional Joint Committee on Internal Revenue Taxation. Their agenda contains 33 categories of tax laws and tax code defects.

Treasury spokesmen say it may take two or three years to rewrite the tax laws. The plan is to get amendments acted on by Congress as they are formulated, thus providing relief as soon as possible.

CONGRESS CONSIDERS TAXES
. . . are reductions in sight?

Republican Rift Refuted . . .

Informed observers discount reports of rifts between President Eisenhower and Republican leaders in Congress. For example, the proposed change whereby Congress could kill future reorganization plans of the President by a simple majority of those present in either house was construed by some commentators as "the end of the honeymoon."

Such reports were killed when the White House made it clear that the President had given advance approval to the proposed change.

Inasmuch as Republican congressional leaders meet with President Eisenhower each Monday morning, and considering Ike's peculiar ability to get along with people, the outlook is promising for close coordination of the legislative and executive branches.

Trim Budget's Billions . . .

The belief that several billions can be knocked off the Truman budget grows within the Republican camp. There are encouraging signs of savings to be effected within many departments and agencies.

In the Defense department, where much of the expected savings must be applied, an item that sells at $3.95 per 1000 including commercial packing, was bought by the Detroit Ordnance District in April, 1952, at that cost, plus $56.71 per 1000 for special packing.

Washington sources report that a foreign representative was assigned $14 million to be spent this fiscal year in the country to which he had been assigned. When he reported that only $10 million could be spent effectively, he was advised that his allotment had been upped to $18 million.

The Department of Commerce has scouts throughout the country to report on the value of its services. That's the type of approach that is generally being made. Plans call for continued conferences with the budget director and, as rapidly as sound economies are decided on, recommendations will be made to Congress for reduced appropriations.

Recommend ICC Changes . . .

Chairman Charles W. Tobey (Rep., N. H.) of the Senate Commerce Committee says a management engineering study of the Interstate Commerce Commission recommends that a "managing director" be appointed to take over all the ICC's administrative functions. The report adds that the present ICC organizational structure should be simplified to three staff offices and six specialized bureaus. A bill to order these changes is in the offing.

Unemployment Aid . . .

Identical bills, S-710 and HR-2261, introduced by Senators Theodore F. Green and John O. Pastore and Rep. Aime J. Forand (all D., R.I.) would require establishment of a "Federal Unemployment Account" to which all federal unemployment tax collections would be credited. It would authorize outright federal grants to states whose unemployment funds are in danger of depletion. The legislation is sought to minimize effects of a possible depression.

Just How Clever Is a Fox?

According to fables, the fox is a cunning animal, constantly thinking up new tricks to outwit those who pursue him. But hunters and trappers who really know the creatures say they are easy to catch, displaying intelligence which is actually inferior to that of many other animals they have observed.

There are many beliefs which, like the fox legends, are accepted as truth by those who never question what passes for ancient wisdom. Among such beliefs is the idea that certain kinds of metal pieces must always be cast, or must always be cut from solid, simply because that's how they were made in the 19th century. The fact is, in most cases modern press methods will do the job better and cost less.

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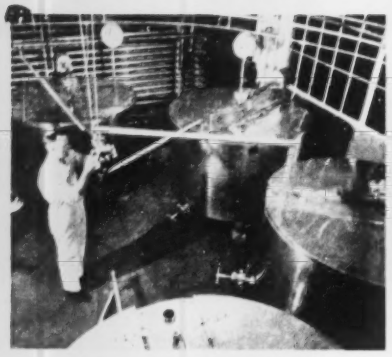
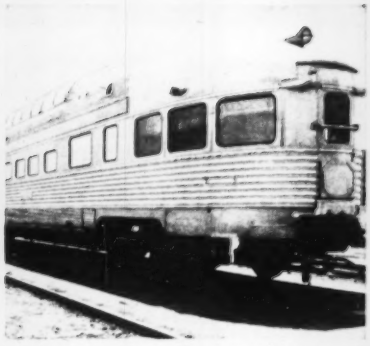


The latest processing and production equipment for the food, chemical and petroleum industries is made of stainless steel. Practically unaffected by the corrosive action to which it is constantly subjected, this new equipment helps keep production costs down, greatly facilitates quality control.

Automotive applications for stainless steels become more numerous with each year's new-model cars and trucks. Today they include such diverse items as exhaust valves and door handles, water pump shafts and radiator grilles, decorative trim and truck bodies.



Lighter, more durable railroad cars are made possible by structural members and side paneling of strong, corrosion-resistant stainless steel. In both freight and passenger service, these cars are cutting railroad operating and maintenance costs, increasing the speed, safety and comfort of rail travel.

Why so many are saying...

MAKE IT STAINLESS

Manufacturers of everything from can openers and hub caps to railroad cars and jet engines are now saying, more and more frequently, "*make it stainless.*"

Virtually indestructible by corrosive action, stainless steels defy the effects of air, water, foods, fumes and chemicals. They can be machined, formed and fabricated; their surfaces can be polished satin-smooth or mirror-bright. There are grades of stainless available to meet a wide range of mechanical and heat-resistant requirements.

Stainless steels are cutting production costs, improving product performance and appearance, increasing customer acceptance in an ever-growing number of applications. For complete information in regard to your own application, contact your supplier.

The finest stainless steels are made with Vancoram ferrochromium, ferrochrome-silicon and ferrotitanium.

Architectural components of stainless steel range from screws, nails and decorative trim to roofing, curtain walls and theater marquees. Strong and corrosion resistant, they cut construction and maintenance costs, yet increase beauty and efficiency, in all types of modern buildings.

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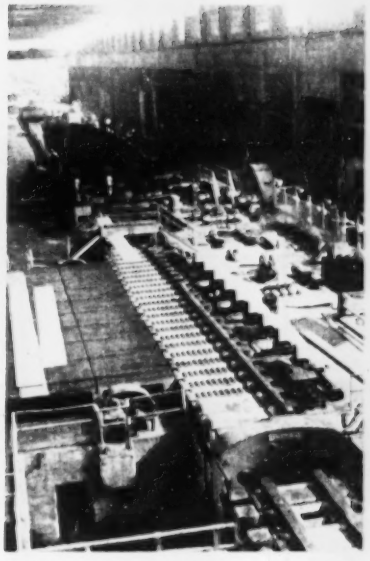
THE BLAST FURNACE AT BRAZIL'S VOLTA REDONDA STEEL PLANT
. . . another will be built in the current expansion program



ROLLING MILL AT VOLTA REDONDA
. . . demand rolls up fast too

Demand Outgrows Brazilian Steel Plant

The Volta Redonda steel plant will complete its third expansion this year. Already plans are being made to further increase output to a million tons a year

HOW CAN Brazil catch up with steel demand? That's the question asked by J. G. Pinheiro, head of the Brazilian National Steel Co.'s expansion commission in Cleveland. The availability of domestically produced steel products has expanded the uses for steel in Brazil so rapidly that one expansion of NSC's Volta Redonda plant isn't done before another is needed.

Originally, Volta Redonda consisted of one blast furnace and three open-hearth furnaces. Before that installation was in complete operation another open-hearth furnace was added. The integrated plant then had a capacity of 473,000 ingot tons. Current expansion plans, being worked out in co-operation with Arthur G. McKee Co., Cleveland, will add one blast furnace, with a 26' 6" hearth, and 2 open hearths. The capacity will be 715,000 ingot tons then.

More Than Ever — But further plans are already being made to raise the output of Volta Redonda to a million tons or more of steel a year. Even that will not completely supply growing demand.

Why is it seemingly impossible to catch up with demand? Probably the biggest reason is that many consumer goods, formerly little known and sometimes mistrusted, have become available from domestic sources and are becoming standard items in Brazilian life. For one thing, tinned foods are being rapidly accepted as Brazilian food manufacturers expand canned food production with Volta Redonda tin plate. Last year, Brazil's total annual need was about 100,000 tons of tin plate, of which Volta Redonda supplied 40 per cent.

Raising the Roof — Other steel products available from Redonda's finishing mills are rails, structurals, heavy plates, hot-rolled coils and sheet, cold-rolled coils and sheet, and galvanized sheet. Recently a structural fabricating shop began operations. At present, most Brazilian construction up to 12 stories high is in reinforced concrete. With the availability of fabricated structurals a spurt in that type of construction is expected.

At first, Brazilians did not want to use domestically produced steel, preferring to import what they needed from the U. S. or Europe. Practice has shown, however, that Brazilian steel has exceptionally good working qualities; it flows easily, due to the low scrap content. About 75 per cent of the open hearth melt is hot metal charge and the other 25 per cent is made up of plant scrap. Brazilian iron ore used at the blast furnace reportedly has an average 66 per cent iron content.

New Uses—Gradually the reluctance to use domestic steel was overcome. Today some parts are being made of Brazilian steel for refrigerators made in General Motors' Brazilian plant and for use in Ford's Brazilian plant.

Other facets of the integrated Redonda plant have had great effects on Brazilian industry. The metallurgical coke plant has yielded benzol, toluol, xilil, engine fuel, tar, ammonia, sulphate of ammonia, pitch, crude naphtha, antracenic oil, creosote and heavy naphtha. Brazil's chemical, agricultural, pharmaceutical, insecticide and plastics industries have been able to develop more rapidly.

Significant Socially—Quite as important as the industrial development spurred by Volta Redonda are the social implications of the employee profit sharing plan used there. About 10 per cent of the net profit of the Brazilian National Steel Co. is set aside for employees' shares, which may vary from two to four weeks pay.

Market Researcher Frank Minnelli knocks on industry's door

. . . Analyzes markets for ideas with IBM Supervisor Bill Roth

. . . Interprets statistics in an advertising program discussion

This is the fifth in a series on what various types of executives do on a typical day. For others, see STEEL, Apr. 14, 1952, p. 74, on a purchasing agent; June 9, 1952, p. 72, on a sales vice president; Aug. 18, 1952, p. 75 on a company president; and Nov. 10, 1952, p. 79 on an inventor-engineer.

A Management Tool—

MARKET RESEARCH

"YOU NEVER know what will turn up in field surveys," explained Frank Minnelli to the Canton, O., food distributor last March when asked why he had "sent that poor girl into a barbership looking for hoists."

Frank P. Minnelli, market research manager of Yale & Towne Mfg. Co.'s Philadelphia Division, was ringing industry door bells to learn the market potential for a new hoist his company considered introducing. No hoists were unearthed in barber shops but they were in such unlikely places as a school basement, a bank and a florist shop.

Baring The Facts—Marking off areas of Canton that would give a sample of all business establishments regardless of size and activity, Mr. Minnelli and a group of Elmo Roper interviewers got facts.

While the survey indicated a market for the hoist existed, the results convinced Yale & Towne management that it wasn't large enough to justify the cost of necessary retooling. Expense of the grass roots survey was easily balanced by forestalling the questionable venture.

A Management Tool—The Canton report (neither point-blank prediction nor statistical mumbo-jumbo) is but one example of how Frank Minnelli's market research provides guidance in business planning for Yale & Towne. It believes facts and statistics properly selected, analyzed and interpreted and at times supplemented by field work can be invaluable tools for executive decision-making.

A lot of other metalworking companies are beginning to think so too. They're sizing up every available weapon for the tough competitive battles ahead. A survey by STEEL (Jan. 5, p. 122) of over 1000 metalworking firms showed 8.8 per cent have a formal market research department. Significant is the fact that 4 per cent of those reporting plan to start one in 1953.

No Cure-All — Market research can't be asked to come up with all the answers. As Frank Minnelli puts it, "market research is neither a catch-all nor a crystal ball department." Here's how his evaluations fit into the business scheme, as shown by one typical day at the plant.

The morning mail brings to nearly everyone problems that must be handled immediately. One of them for Frank Minnelli this crisp winter day is a memo from a district sales office requesting an analysis of foundry applications for fork trucks. Then, picking up on a project started the day before, Mr. Minnelli completes his monthly report of current departmental activities for Elmer F. Twyman, Yale & Towne vice president and head man at the sprawling Philadelphia division a 750,000 square foot one-floor plant employing 2800.

Loose-Knit — Departmental reports are incorporated into a divisional review for company headquarters in New York where a corporation-wide summary of monthly activities in the semi-autonomous division is made. The Philadelphia Division is a major contributor to the company's near-$100 million sales volume.

Next on the morning agenda comes a reminder to Statistical Assistant Jean Cobb on getting out monthly reports to the Industrial Truck Association, clearing house for statistical information on sales of gas and electric trucks and motorized hand trucks. Such complete and accurate data is a market researcher's life blood.

Co-ordinating — A mid-morning

. . . Points out market potential to Sales Manager James Conklin

. . . Checks sales reports with Statistical Assistant Jean Cobb

. . . Compares prices with Price Bureau Director Tim Dunleavy

conference follows with Minnelli's chief, James A. Shellenberger, director of advertising, publicity and marketing research, and John T. McCarley, assistant general manager of the division. Mr. Minnelli is called on to analyze and interpret data on advertising inquiries and sales by industry as they relate to the division's sales and advertising program. By a continuing project of collecting raw statistics on punched cards for automatic tabulation by IBM machines, the market research department can furnish complete data on every materials handling product made by Yale.

Following this meeting and a word with Tim Dunleavy, director of the price bureau, to get pricing information on various sizes and types of trucks for comparison studies of the industry, Mr. Minnelli looks over a list of bookings from the gas and electric truck sales departments that have been checked to determine amount, type and location of new business booked by those departments during the month.

Guideposts of Potential—After lunch a call from James H. W. Conklin, general sales manager, seeks an explanation of some statistics in an economic area report for the Chicago sales office. These reports enable field men to pinpoint sales strengths and weaknesses in their territories by industry and products; for maximum utility they must be co-ordinated with personal knowledge of field men.

Back at his desk, Mr. Minnelli goes to work on an executive marketing summary his department is preparing. It shows distribution of Yale sales by Standard Industrial Classification and product classification for four major lines produced by the division: Gas and electric trucks, motorized hand lift trucks and hand trucks.

Sighting Targets—New product studies, surveys to improve old products and development of new markets all fall within Frank Minnelli's province. Two recent projects of the market research department were an analysis of advertising effectiveness and a study of buying influences.

Also in preparation is a five-year forecast of Yale sales by product classification to be included in a company-wide forecast of sales possibilities through 1957.

Four-Fold Expansion—"Normal measuring sticks aren't valid in many of our determinations," says Mr. Minnelli, "because the materials handling industry is relatively young. Materials handling has shown about four times normal industry growth since 1940.

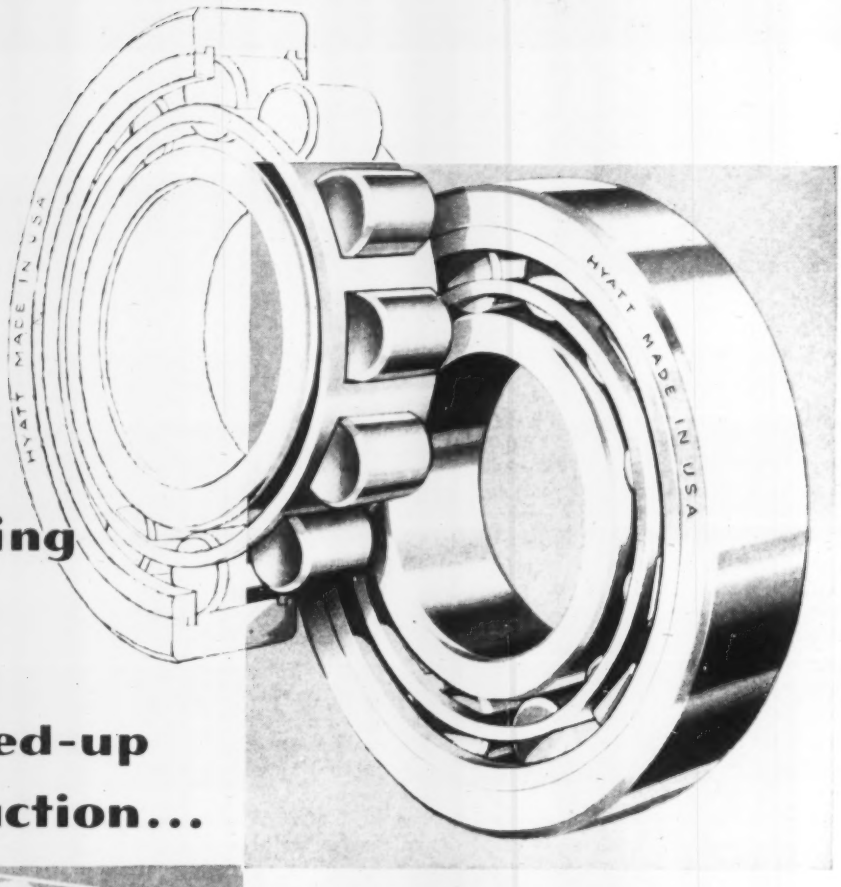
"War, scarcities and rapidly rising labor costs have forced industry to re-evaluate materials handling methods. It's one of the last frontiers left where substantial savings can be made. We're now drawing on the small crop of depression babies for both the normal labor market and for the armed services. That means a protracted period of labor shortages in the next eight years and use of more women and older men on production lines. These facts spell good business for makers of any labor-saving equipment."

On The Road—The telephone interruption is for instructions on printing charts showing the importance of certain markets for sales of the new Yale Warehouser truck. This unit, a rider-type straddle fork lift truck, sent Mr. Minnelli on a survey last fall in Syracuse, N. Y. selected for its highly diversified types of industry and business within a limited area. Object of the survey was not to prove product acceptability but to determine markets and potential uses for the Warehouser not visualized by the manufacturer's sales department.

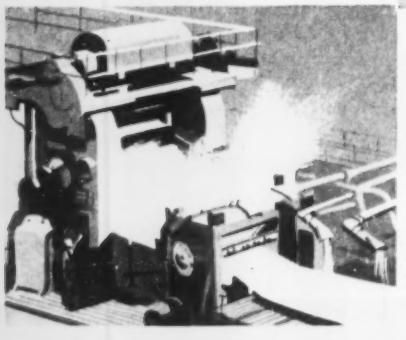
Toward the end of the day a product sales tabulation comes in, showing an industry-wide downtrend for one type of truck. No statistical explanation for the decline can be established; on advice of Mr. Twyman, plans are drawn for making personal interviews to find some reasons why. Mr. Minnelli thinks field surveys are a desirable supplement to internal and external statistics.

Custom-Fit — "Industrial research," says Mr. Minnelli, "differs in many ways from consumer research, is more specialized. Industrial studies have to be tailor-made to fit the product and its existing market."

More and more, industry is realizing that evaluating customer wants and determining seasonal and cyclical sales patterns lead to intelligent production programming and control. Accurate gaging of markets will be even more of a management must in the hard-selling days ahead. With sound advice from market researchers like Frank Minnelli, management will be well-equipped to make realistic production and merchandising decisions.



Keeping pace with stepped-up production...



Hyatt precision bearings

Built to carry the BIG loads, Hyatt Roller Bearings are playing an increasingly important role in America's record-breaking steel production. In tables, cars, cranes and other auxiliary equipment, Hyatts are the preferred steel mill bearings because they ease shock loads, extend equipment life and reduce operating costs. If Hyatts are not already Standard in the equipment you purchase, they can be had upon specification or used for changeovers. For conclusive data about Hyatt bearing performance, write to Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

HYATT ROLLER BEARINGS

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

The redesigning job on Chrysler's power steering unit shows what can be done to save weight and parts. Gemmer, maker of the equipment, says it's better than ever

DETROIT

INVOLVED in manufacture of the redesigned power steering unit to go on the Chrysler about Mar. 1 are aluminum die casting, powdered metallurgy, injection mold plastics and sand cast aluminum.

All that resulted in an elimination of 30 parts and a weight reduction of more than 25 per cent. Machining, assembly and manufacturing savings indicate the case is worth close study by metalworking men. Some of the high points are as follows:

Housing—Formerly a malleable casting, the housing will be manufactured of cast aluminum. The distribution and transfer of oil to and from power cylinders was formerly accomplished through steel tubing and banjo fittings. Now it's cored internally in the castings, eliminating the exterior lines and several possible sources of oil leakage. Grease as a lubricant has been eliminated through the new design with 10 W oil now serving the dual purpose of lubrication and power medium, eliminating two oil seals and further simplifying assembly.

Cylinders — Formerly a drawn cup threaded type cylinder held in position with a lock ring, the cylinders now will be made of a high strength gray cast iron with flange construction. The part and assembly simplification savings more than offset the weight increase factor.

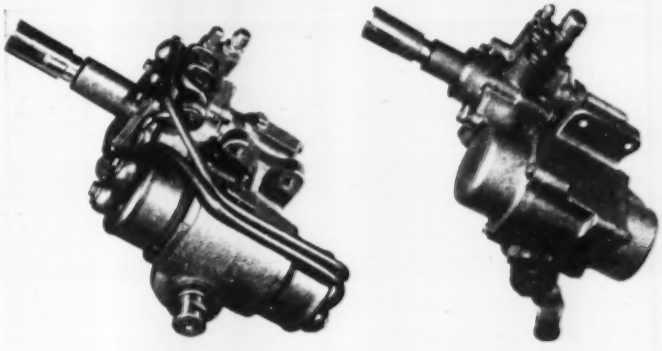
Valve Body—The valve body is being die cast from aluminum with a virtual elimination of all machining. Three parts are eliminated, servicing of the gear is aided through marking the identification of the individual valve ports and a weight reduction of 70 per cent is accomplished.

Piston Ends—The power piston, formerly constructed of three individual parts has been simplified through aluminum die casting to include just two fundamental components.

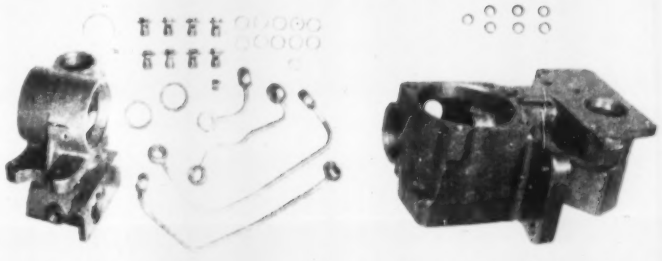
Valve Operating Block—Powder metallurgy has been used successfully to effect economy in this part as compared to its former machine fabrication from steel. The required machine operations are greatly reduced and stock waste eliminated.

Column and Driver—In previous models tubing was butt-welded to a machined driver; this part is now being forged integrally as a unit simplifying manufacture and

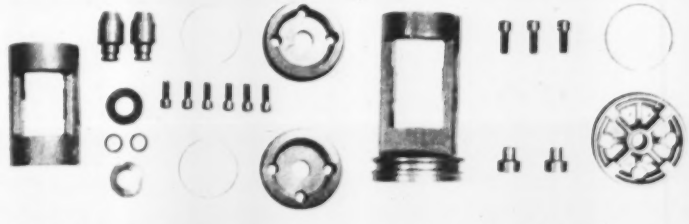
NEW HYDRAGUIDE POWER STEERING UNIT has 30 fewer parts, 25 per cent less weight



As it is now, unit at left is primarily iron and steel; has external oil lines. New unit at right is mostly aluminum; has no external oil lines



Cast iron housing, left, needs parts for sealage of worm cavity for use of grease. Sand cast aluminum housing eliminates the grease, saving parts



The old type cast iron piston assembly at left is composed of 17 parts. The new die cast piston assembly at right requires only 10 components

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at the same time lowering costs.

Valve Cap—Another application of aluminum die casting virtually eliminates machining formerly required.

Gemmer Mfg. Co., Detroit, manufacturer of Chrysler's "Hydraguide," reports its design changes have been verified through extensive road and laboratory experimentation. "Not only have economies been effected in manufacture, machining and assembly," says Clare Holt, design engineer, "but cleaner lines, reduced weight and fewer points of possible operational discrepancies are also effected in the new design."

Exhaust Notes

Enthusiastic acceptance of the Corvette, Chevvie's sports car, coupled with the impending entrance of K-F into the field, has engineers working late at GM these nights. Their efforts may well bring the Corvette curbside by mid-year.

Selling for approximately $3000 it will have a steel body, not fiberglass like the K-F. Dual carburetors from the Chevvie 6 will put out about 160 horsepower in the engine department, and a Powerglide transmission will be added. Incidentally, the new Chevrolet Bel Air line will be sprouting push-button window lifts by mid-year to go with its Cadillac-like interior. Tooling is also said to be under way for a V-8, probably to go into the Bel Airs in 1954. Chevrolet envisions the new line as the poor man's answer to the Caddie.

One automaker is further along than many competitors suspect in licking the problem of volume production of plastic auto bodies. The company's research department is making fast progress in getting big output from the plastics equivalent of stamping hot press-forming from sheets of plastic. Alligatoring, that wrinkle-finish bugbear of sprayed plastic bodies, is reported nonexistent with the hot-pressed technique. Extremely deep and complicated draws are possible with the process, a boon to the imaginations of designers being pushed for futuristic, but feasible, body styles.

Mercury's overhead valve engine line in Cleveland is reported finished and pilot models have already been run. Watch for Mercury to hit any severe market slump this summer with introduction of its new power plant. Adding features as the market demands them rather than with new model introduction seems to be taking vogue in Detroit.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,691	658,918
March	517,207	792,550
April	576,505	680,281
May	546,673	695,898
June	560,947	653,682
July	246,461	522,858
August	293,722	571,442
September	592,253	505,758
October	645,862	558,971
November	556,366	480,323
December	568,577*	402,729
Total	5,590,832*	7,161,427

Week Ended	1953	1952
Jan. 10	139,620	92,669
Jan. 17	148,718	98,669
Jan. 24	149,578	94,722
Jan. 31	150,381	102,402
Feb. 7	151,500*	102,406

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Rumors of the Week

Conversation in town has it that Dodge is very much interested in the sports car field. Some say that the 140 hp Red Ram power unit is turning out to be too hot for the more conservative buyers, but in a sports car it would be a real bomb.

Another rumor says Lincoln is considering a return to its Continental line. Dropped early in the postwar years, these beauties were most famed for the exposed spare tire derrierre. The name has been kept alive by this "continental" accessory currently available for most new cars. Many say the current Lincolns don't look distinct enough from the other autos in the Ford family and continentalizing once again could be the answer to the problem.

Preston Tucker whose advance accessory sales for the autos he was never able to produce made some kind of automotive history, has denied that he'll be making any more autos. But some in the Motor City are saying he's looking beyond his Ypsilanti, Mich., tool business.

Autos Going Great

If you hadn't heard, automakers are really floorboarding production. The biggest quarterly automotive production since 1950 seems to be shaping up—1,760,000 units says *Automotive News*. A hefty 141,369 U.S. cars and trucks during the last week in January was the highest since 146,654 units left the lines the last of October, says *Ward's Automotive Reports*.

General Motors reports its current employment running almost 500,000 and Ford Motor Co. employment is 164,427—highest for the firm since 1944. Chrysler Corp. more than doubled its manufacturing operations in California in 1952 and will continue expansion in 1953.

Willys-Overland reports fourth quarter 1952 sales of $94 million, up 42.6 per cent over the same period in 1951.

Buick modestly reports that it led the world in the production of hardtop convertibles in 1952 with a total output of 92,671 units of the 553,866 which hit the roads from all manufacturers.

Continental Sets a Record

Continental Motors Corp. notched the highest sales and working capital in its history during 1952. The first Continental engine was displayed at the Chicago automobile show in January, 1903, following the founding of the firm in September, 1902. Its fiftieth anniversary sees the firm with net earnings amounting to $6,126,021, exceeded only once previously.

The firm currently makes agricultural, irrigation, aviation, industrial, transportation, marine and military engines. It is also developing a line of small gas turbines for military and commercial use, while a subsidiary company, Continental Aviation & Engineering Corp., is to supply from this turbine line a model for use in a new twin-jet primary training plane to be built for the Air Force by Cessna Aircraft Corp.

Finer Than a Watchmaker's Masterpiece!

This operation is typical of the laboratory-like techniques used on many precision bearings. The highly skilled operator is wearing special kid gloves to avoid contaminating the ball bearing.

New Departure ball bearings are quickly available at your equipment dealer or bearing distributor supplied from the industry's largest nation-wide network of warehouse stocks.

NOTHING ROLLS LIKE A BALL

NEW DEPARTURE

BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

Also Makers of the Famous New Departure Coaster Brake

The finest products of the watchmaker's art do not reach the high level of precision attained by New Departure ball bearings. Manufacturing standards which insist on certain tolerances being held to millionths of an inch give these bearings the ability to provide the virtually friction-free support demanded by moving parts of machines.

In the metal working industry, New Departure "Sealed-for-Life" ball bearings make possible better design of machine tools. N-D-Seals eliminate the need of fixtures and lines for bearing lubrication . . . in many instances requiring less housing space and fewer parts.

Research, engineering and production at New Departure are focused on one major objective . . . making the *best* ball bearings for every kind of application. Keep your eye on the BALL to be sure of your BEARINGS!

Are your high temperature tubes giving you the best life/cost ratio? *Ask the experts!*

This month's report is on: **DM STEEL**

Has unusually high creep strength for a pearlitic steel, good stability up to 1200° F., fairly good corrosion and oxidation resistance. Has 2 to 3 times the life of carbon steel where corrosion is not severe. Recommended for cracking furnace tubes, hot oil lines, superheater tubes, high temperature steam piping and forgings for accessory parts.

ONE OF 24 TIMKEN HIGH TEMPERATURE STEELS

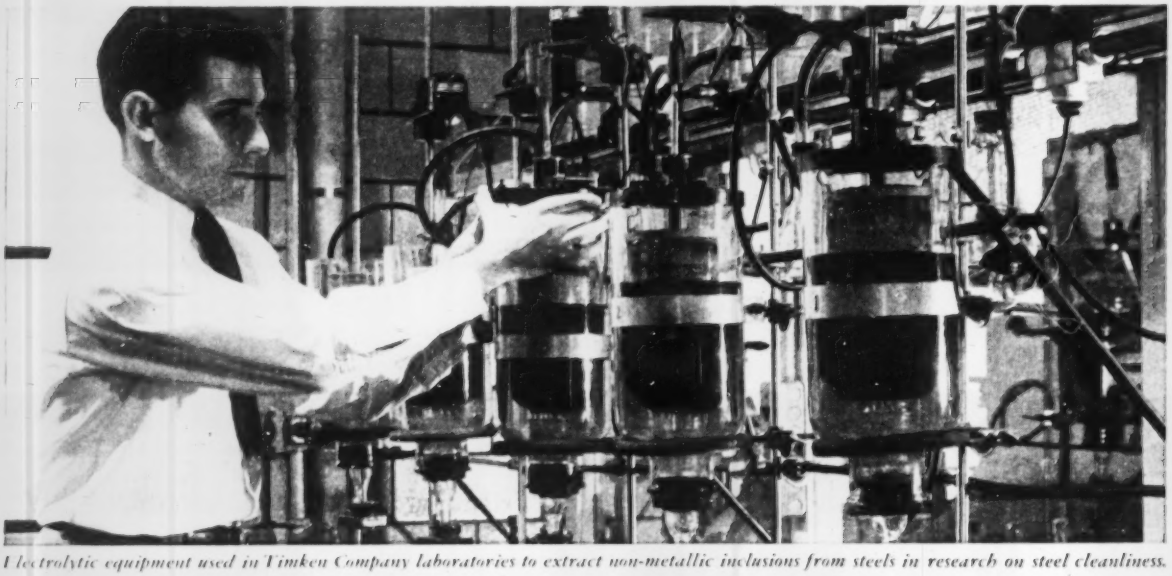
Carbon	Sicromo 2	Sicromo 5S	18-8 Ti
Carbon-Mo.	Sicromo 2½	Sicromo 5MS	16-13-3
DM-2	2½% Cr.-1% Mo.	Sicromo 7	25-20*
Silmo	Sicromo 3	Sicromo 9M	25-12*
DM	4-6% Cr.-Mo.	18-8 Stainless	35-15**
2% Cr.-Mo.	4-6% Cr.-Mo.-Ti.	18-8 Cb	16-25-6**

**Available as seamless tubing on an experimental basis only.*
***Not available as seamless tubing.*

CHANCES are there are several high temperature tube steels that will solve your particular combination of heat, pressure, oxidation and corrosion problems. But there's only *one* analysis that will give you the best life/cost ratio.

The best way to find that one steel is to *ask the experts*—metallurgists of The Timken Roller Bearing Company. They're recognized authorities on high temperature steels, backed by 20 years' experience. With 24 different analyses to choose from, they'll help you pick the steel that's best suited for your particular application. And you'll be assured of uniform quality in every tube because the Timken Company rigidly controls the quality of the steel from melt shop through final inspection.

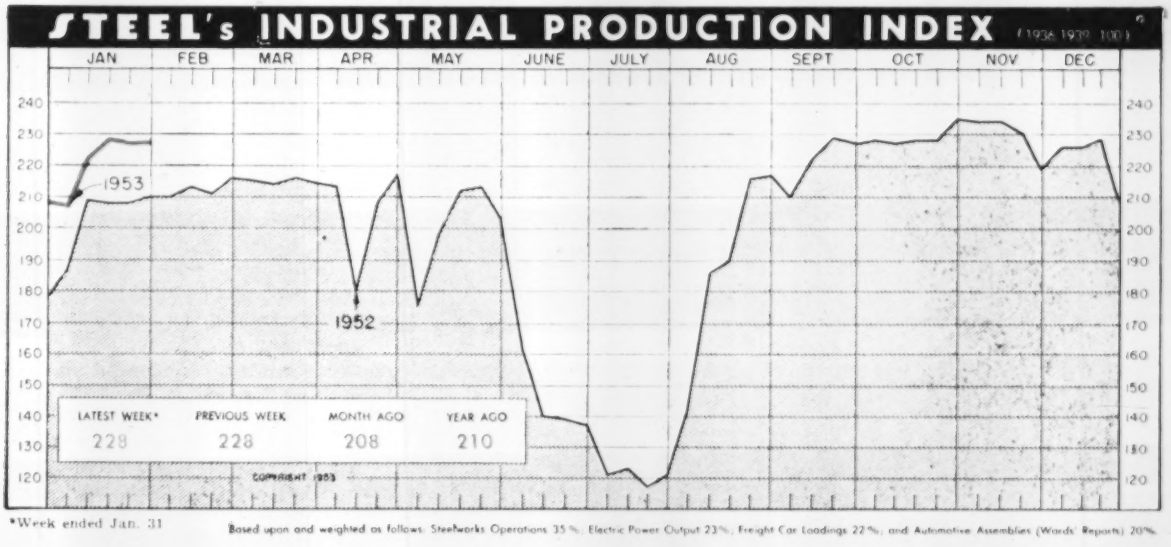
Let the Timken Company's RSQ—Research, Supply, Quality—solve your tube problems. *Ask the experts!* The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".



Electrolytic equipment used in Timken Company laboratories to extract non-metallic inclusions from steels in research on steel cleanliness.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Jan. 31

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Industrial activity may remain on its high plateau during the next few months. Reports indicate that demand for consumer durables is still rising

BUSINESS continues to roll along on its high plateau with little indication it will deviate much in the next few weeks.

The leveling-off in activity is apparent in the Federal Reserve Board's industrial production index. It estimates the nation's output in January rose only 1 point to 236 per cent of the 1935-1939 average. Far more dramatic gains have been the rule since the end of the steelworkers' strike.

Demand Strengthens—Consumer durables are still one of the brightest spots in the industrial picture. Factories in January boosted their output of major consumer durables nearly 40 per cent over the January, 1952, rate. Automotive companies displayed one of the strongest performances by producing at an annual rate of 5.5 million passenger cars. The uptrend in durables will probably continue now that civilian industries will get more steel. Most durables producers say demand is still on the upswing.

Significant declines, however, are also shown by the index. Bituminous coal production is far under the normal level as tall stockpiles and warm winter weather slow mine operations. Iron ore output is also dropping from the exceptionally high levels attained this fall, for winter ore supplies are assured for most steel plants.

Balancing Out—Further indication that business activity is moving sidewise is seen in STEEL's industrial production index. The index in the week ended Jan. 31 remained unchanged at 228 per cent of the 1936-1939 average. Steel production for the third consecutive week remained at 99.5 per cent of capacity. Automotive production and freight car loadings inched upward, but these gains were offset by the seasonal decline in electricity production. Power generation usually reaches its peak in mid-December.

Business Outlook Good . . .

Business will remain good for at least three or four months, but no sharp improvement is on the horizon. That's the consensus of buyers surveyed by the National Association of Purchasing Agents.

Industrial purchasers in January showed considerable caution in placing new orders. The association says there was a marked movement into the 30-60 day buying range from the 60-90-day. Watching the downtrend in prices, most P.A.'s were hesitant to place large orders. This hesitancy is probably behind the lag in railroad shipments of many durables.

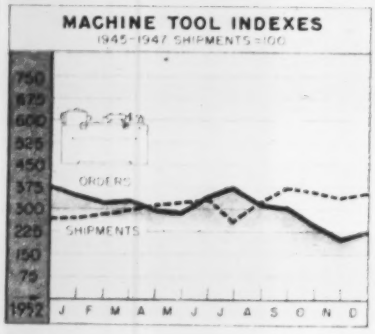
Inventories in January continued on the downtrend at about the same rate as in the previous three months. Some stocks are reported getting too low for comfortable operations, although very few materials are critically short.

Employment in January moved upward, after declining seasonally in December. Reports of longer workweeks and additional shifts increased as demand rose for skilled and white collar workers. Productivity improved in January since labor unrest abated.

Industrialists are taking a sharp look at their profit position. Numerous comments in the January survey concerned low profits and high break-even points. Many companies slated their proposed capital expenditures for plant modernization, rather than capacity expansion.

Acceleration in Autos . . .

The automotive industry is eying ways to raise its high output even further. Some U. S. manufacturers

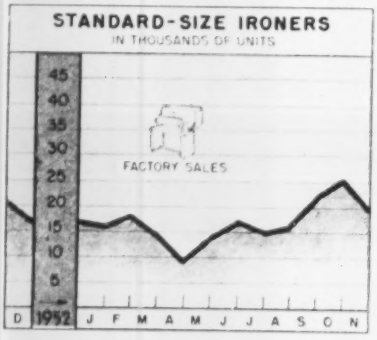


Machine Tool Indexes

1945-1947 Shipments = 100

	New Orders		Shipments	
	1952	1951	1952	1951
Jan.	347.8	475.4	266.6	114.3
Feb.	318.8	615.5	279.6	123.8
Mar.	324.3	590.3	295.5	158.9
Apr.	293.5	516.1	307.9	157.7
May	244.6	483.0	323.0	175.1
June	342.9	455.8	330.8	182.8
July	316.3	400.6	259.7	144.7
Aug.	311.1	488.9	317.0	178.9
Sept.	302.4	380.2	268.3	189.8
Oct.	243.3	462.9	357.8	221.3
Nov.	261.4	330.5	342.5	226.9
Dec.	222.5	376.6	344.2	264.7

National Machine Tool Builders' Assn.

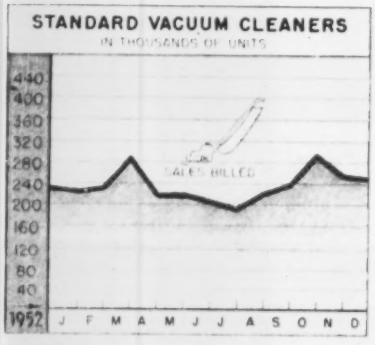


Standard Size Ironers

Factory Sales, Units

	1952	1951	1950
Jan.	15,636	24,600	26,300
Feb.	17,630	32,100	27,600
Mar.	13,913	34,700	32,800
Apr.	8,958	25,700	31,600
May	12,632	24,200	27,400
June	17,654	24,500	27,100
July	15,025	11,100	25,100
Aug.	16,477	17,200	42,700
Sept.	22,492	18,300	41,400
Oct.	25,204	29,800	42,500
Nov.	19,724	26,500	41,500
Dec.		16,900	38,800
Total		277,500	405,200

American Home Laundry Mfrs. Assn.

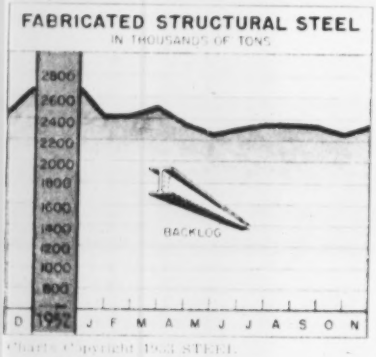


Standard Vacuum Cleaners

Sales Billed, Units

	1952	1951	1950
Jan.	223,347	282,305	219,150
Feb.	230,226	261,572	263,515
Mar.	290,602	290,242	361,014
Apr.	217,169	227,216	292,664
May	216,569	261,983	278,645
June	206,529	191,348	250,190
July	188,215	161,602	259,967
Aug.	222,433	191,299	341,202
Sept.	235,141	210,486	327,524
Oct.	292,474	259,469	331,445
Nov.	254,247	219,959	265,316
Dec.	249,632	230,263	288,256
Total	2,841,803	2,729,494	3,529,114

Vacuum Cleaner Mfrs. Assn.



Fabricated Structural Steel

Thousands of Net Tons

	Shipments		Backlogs	
	1952	1951	1952	1951
Jan.	214.9	214.0	2,416	2,401
Feb.	246.4	193.6	2,408	2,500
Mar.	253.8	234.1	2,401	2,602
Apr.	230.7	244.1	2,350	2,504
May	244.2	244.4	2,263	2,471
June	124.6	247.1	2,261	2,636
July	158.3	204.4	2,361	2,688
Aug.	226.3	236.9	2,363	2,748
Sept.	227.6	228.3	2,342	2,580
Oct.	261.7	251.0	2,266	2,611
Nov.	222.6	218.2	2,337	2,438
Dec.	225.2	202.7	2,453	2,670
Total	2,664.3	2,465.5		

American Institute of Steel Construction

Charts Copyright 1952 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Nov. 21	Gray Iron Castings	Jan. 12	Ranges, Elec.	Feb. 2
Durable Goods	Jan. 18	Indus. Production	Dec. 22	Refrigerators	Feb. 2
Employ. Metalwkg.	Jan. 18	Malleable Castings	Jan. 12	Steel Castings	Jan. 12
Employ., Steel	Dec. 15	Pumps	Dec. 8	Steel Forgings	Jan. 12
Foundry Equip.	Dec. 29	Prices, Consumer	Jan. 26	Steel Shipments	Nov. 3
Freight Cars	Dec. 29	Prices, Wholesale	Jan. 26	Wages, Metalwkg.	Jan. 26
Furnaces, Indus.	Feb. 2	Radio, TV	Feb. 2	Washer	Dec. 29
Gear Sales	Jan. 26	Ranges, Gas	Jan. 18	Water Heaters	Jan. 18

are returning to Saturday operations and others may soon follow suit. But an industry swing to extra week-day shifts—as was the rule during last fall—is probably not in the cards.

U. S. passenger car production in the week ended Jan. 31 climbed to 117,635 units, the largest total in 12 weeks, says *Ward's Automotive Reports*. This end-of-the-month showing is about 63 per cent over passenger car assemblies in the week ended Feb. 2, 1952.

Truck production in the U. S. that week dipped 3076 units to 23,734 assemblies as model changeovers took place at the Ford Motor Co. Truck assemblies in the final week of January declined 903 units under the comparable week in 1952, the first over-the-year lag in many weeks.

U. S. and Canadian car-truck output in the week ended Jan. 31 inched up 803 units to 150,381 assemblies. This 150,381-unit production is about 49 per cent over U. S. and Canadian turnout in the week ended Feb. 2, 1952.

Construction Outlays Up . . .

Expenditures on new construction are still flowing faster than a year ago, but builders' physical volume is about the same—as higher costs boost dollar outlays.

The Bureau of Labor Statistics reports that new construction put in place during January was valued at $2.3 billion dollars, up 6 per cent from a year earlier. January marked the fourteenth successive month in which dollar volume scored a year-to-year gain.

Increases in private residential building, private commercial work and some major types of public construction aided the January showing.

Orders Up for Structurals . . .

Bookings for structural steel indicates that the present high outlays for construction may remain high in the next few months. The American Institute of Steel Construction says that contracts were closed in December for 236,264 tons of fabricated structural steel. This compares with 202,835 tons ordered in December, 1951.

Increased production, however, is whittling away on the industry

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	99.5	99.5	101.5
Electric Power Distributed (million kwhr)	8,130	8,144	7,572
Bituminous Coal Output (daily av.—1000 tons)	1,529	1,583	1,870
Petroleum Production (daily av.—1000 bbl)	6,500[1]	6,491	6,225
Construction Volume (ENR—millions)	$599.9	$229.1	$212.5
Automobile, Truck Output (Ward's—units)	150,381	149,578	102,402
TRADE			
Freight Car Loadings (unit—1000 cars)	700[1]	698	731
Business Failures (Dun & Bradstreet, number)	162	173	164
Currency in Circulation (millions)[3]	$29,592	$29,687	$28,347
Dept. Store Sales (changes from year ago)[3]	+4%	+4%	+4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,283	$15,810	$18,505
Federal Gross Debt (billions)	$267.3	$267.3	$259.6
Bond Volume, NYSE (millions)	$18.3	$19.9	$15.7
Stocks Sales, NYSE (thousands of shares)	8,208	6,866	8,975
Loans and Investments (billions)[4]	$77.7	$78.0	$73.6
United States Gov't. Obligations Held (billions)[4]	$32.0	$32.3	$32.2
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	213.4	213.2	243.6
STEEL's Nonferrous Metal Price Index[6]	181.31	181.31	171.92
All Commodities[7]	109.4	109.6	113.5
All Commodities Other Than Farm and Foods[7]	112.7	112.8	114.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1952, 2,077,040; 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

backlog. Manufacturers in December shipped 225,161 tons of structurals, compared with 202,679 tons in the final month of 1951. Industry backlog on Jan.1 totaled 2,152,714 tons, as compared with 2,670,202 tons at the start of 1952.

Consumer Debt Heavy . . .

Metalworking companies that produce civilian goods are wondering how many goods they can push over the consumer credit barrier. Fact is, individuals are more heavily loaded with debts than ever before, and indebtedness is climbing. The Federal Reserve Board says that consumer installment credit in 1952 increased more than 11 per cent to a peak $23.9 billion. Recent tightening of installment credit may mean that civilian manufacturers will find many persons can't afford that new refrigerator this year.

TV Soars, Radios Plunge . . .

Perhaps nowhere on the industrial scene has changing public tastes been felt more keenly than in the civilian electronics industry. Strident demand for television sets has trimmed radio output to a near-minimum.

Radio-Television Manufacturers Association says that TV set production in 1952 climbed 13 per cent over 1951 output, while radio sets dropped to the lowest point since World War II. Manufacturers turned out 6,096,279 TV receivers last year, compared with 5,284,798 sets in 1951. Production of radio sets in 1952 reached only 9,711,236 units, compared with 12,627,362 sets in 1951. Clock radios, however, were in good demand during 1952.

Yet TV set makers are receiving a warning signal from Hollywood. Officials of 20th Century Fox Film Corp. say they are scheduling a complete change-over to three-dimensional productions. This is a move to lure the public from the TV sets back into the nation's movie houses.

Trends Fore and Aft . . .

Business failures in the week ended Jan. 22 were at the highest weekly level in seven months . . . Freight car loadings are about 5 per cent under the same weeks in 1952 . . . Bank clearings are around 10 per cent over a year ago . . . Awards for heavy construction in January soared 58 per cent over January, 1952 . . . Department store sales are still over the same weeks in 1952 . . . Shipments of steel forgings in November dropped 13 per cent and were 5 per cent below November, 1951.

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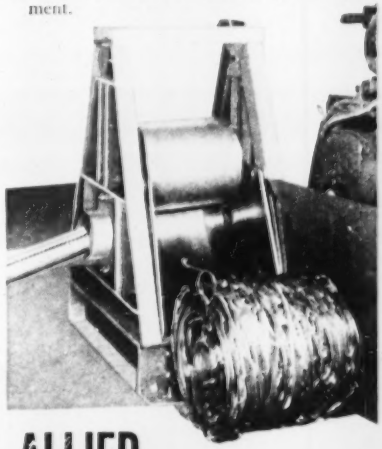

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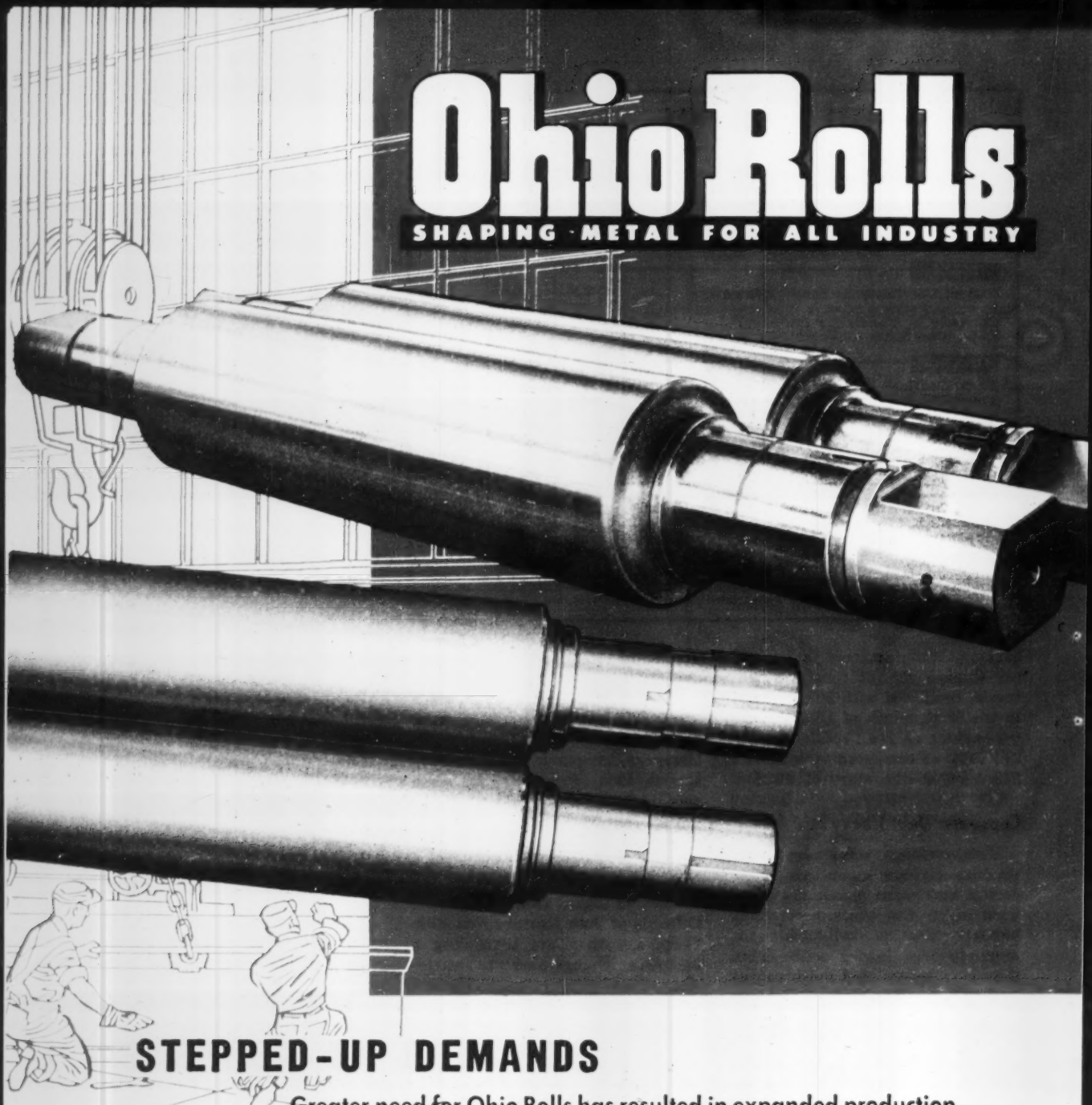

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Men of Industry

ROBERT L. FITZSIMONS
. . . metallurgical engineer at Jessop

GEORGE J. FISCHER
. . . V. P. of Aeroquip

WALTER SUYDAM
. . . Loftus Eng. V. P.-engineering

Robert L. Fitzsimons was appointed metallurgical engineer for **Jessop Steel Co.**, Washington, Pa., a new post in saw and cutting steels created by the company's expansion in those lines. Prior to joining Jessop, he was employed for 30 years by E. C. Atkins Co. where since 1950 he was chief metallurgist.

Great Lakes Pressed Steel Corp., Buffalo, elected **Robert M. Nichols** president and treasurer, and **J. J. Wallace** vice president and secretary. **G. Adolphson**, after over 40 years in an executive capacity with the corporation, was elected chairman of the board of directors, and will be available as consultant.

Ernest L. Black was made manager and **John P. Selberg** chief engineer of the newly formed **Petro-Mechanics Research Division**, Borg-Warner Corp., Chicago. The division, organized primarily to direct development of an earth-penetrating drill that utilizes acoustic vibrations, will be located in North Hollywood, Calif.

Hydro-Blast Corp., Chicago, appointed **Herbert J. Niemann** vice president-sales, **P. C. Will** as vice president-engineering, **W. F. Gamble** secretary-treasurer, and **J. W. Watson** as chief production engineer.

George J. Fischer was elected vice president-sales, and **Matthew J. Betley** as vice president-manufacturing of **Aeroquip Corp.**, Jackson, Mich. Mr. Fischer was advanced from general sales manager and Mr. Betley from works manager.

W. S. Hemsley was appointed Chicago district manager, **Simonds Abrasive Co.**, to succeed the late **W. E. Byrne**. **A. F. Bodine** becomes sales representative for the Indiana territory replacing Mr. Hemsley in that location.

Rodney Hunt Machine Co., Orange, Mass., appointed **Jack W. Rembe** sales manager. He was export manager of the firm for the last five years and now will direct the sales activities of the company's five product divisions in both domestic and export markets.

William A. Reich was appointed manager of advance development engineering at the **Carboloy Department**, General Electric Co., Detroit. For the last seven years he has been engineer in charge of the metallurgy section of GE's Turbine Division Laboratory, Schenectady, N. Y.

Rogers Iron Works Co., Joplin, Mo., announces retirement of **Charles B. Rogers** as president and his election as chairman of the board.

Walter Suydam, formerly chief engineer, was advanced to vice president in charge of engineering for **Loftus Engineering Co.**, Pittsburgh.

Berger Mfg. Division, Republic Steel Corp., Canton, O., appointed **Martin C. Brown** as manager of its steel building products sales division to succeed the late **Alex U. Steenrod**. **R. L. Seiple** succeeds Mr. Brown as assistant manager. **Gerald L. Haynam** becomes district manager, northern and central Ohio district, for the steel equipment sales division replacing Mr. Seiple.

Kenneth M. Ford was appointed assistant manager, **Osco Steel Co.**, Detroit branch. He was sales manager of the Cleveland branch prior to this appointment. Before joining Osco, Mr. Ford was with the Rustless Iron & Steel Division, Armco Steel Corp.

Edward J. Mogol was made secretary-treasurer, also general manager of **John B. Astell & Co. Inc.**, New York.

At **Bethlehem Steel Co.**, Bethlehem, Pa., **W. P. Hill** was changed from assistant general manager of the Sparrows Pt., Md., steel plant to assistant to vice president, steel division. **J. S. Marsh** was made assist-

ant chief of research, **J. K. Killmer** chief metallurgist. **C. T. Stott** becomes assistant general manager at Sparrows Pt. plant, **W. D. Poole** chief metallurgist and **J. J. Link** assistant chief metallurgist.

William Hagel and **Maurice P. Sieger** were appointed to fill vacancies on the board of **United Engineering & Foundry Co.**, Pittsburgh. Mr. Hagel is vice president-sales and Mr. Sieger is vice president and senior engineer.

F. Peter Drake was appointed manager of operations, **Continental Foundry & Machine Co.**, East Chicago, Ind.

At **Buffalo Electro-Chemical Co. Inc.**, Buffalo, division of Food Machinery & Chemical Corp., **G. G. Crewson** becomes director of engineering, **J. N. Vermilya** chief engineer, and **Charles M. Standart** assistant to the chief engineer.

John Jeppson, formerly assistant secretary and works manager, was appointed vice president, **Norton Co.**, Worcester, Mass. He remains as works manager, abrasive division. **A. Donald Kelso,** president of Norton Behr-Manning Overseas Inc. since last October, becomes a Norton Co. vice president in charge of foreign operations and a director. He also retains his Norton Behr-Manning Overseas Inc. post. **Richard Prouty** was made assistant secretary and **Howard J. Daly** was elected to the board.

Cherry-Burrell Co. named **Thomas J. Millon** as purchasing agent of the Wisconsin division at Milwaukee to succeed the late **Thomas A. Bauers.**

The newly created position of design sales engineer for **Geuder, Paeschke & Frey Co.**, Milwaukee, will be filled by **Gilbert C. Gettelman.**

W. A. Mattie was named assistant general manager, heater division, **Eaton Mfg. Co.**, Cleveland.

American Research Corp., Bristol, Conn., started operation Feb. 1 for the design and manufacture of environmental test equipment. **Thomas J. Lopiccolo** is president and **Jack Shamroth** is secretary-treasurer.

E. V. Huggins was elected vice president of corporate affairs for **Westinghouse Electric Corp.**, Pittsburgh, a newly created position. He also becomes president of Westinghouse Radio Stations Inc. **Joseph E. Baudino** was elected executive vice president-operations.

Richard S. Adler was promoted from general sales manager to vice president in charge of sales by **Viking Steel Co.**, Cleveland.

John E. Griffith was named assistant chief industrial engineer of **Jones & Laughlin Steel Corp.**, Pittsburgh.

Herbert D. Euwer was appointed chief engineer, passenger cars, for **American Car & Foundry Co.**, New York. He continues headquarters at the St. Charles, Mo., plant, and succeeds **Allen W. Clarke,** who is retiring after 46 years of service.

John F. Neff was appointed division manager for **Aro Equipment Corp.** in Toledo, O.

Anthony Maladra was appointed assistant sales manager, **KSM Products Inc.**, Merchantville, N. J.

George E. Thomas, representative of **Gisholt Machine Co.** in Hartford, Conn., retired Jan. 1 after 36 years in the New England territory. **Carl F. Welke** joins the company as sales representative in the Cleveland territory, assuming duties of **Ralph J. Miller Jr.,** now a Chicago representative.

Chrysler Corp., Detroit, appointed **A. E. Kimberly** chief engineer, DeSoto Division and **Robert Anderson** as chief engineer, Plymouth Division.

At **Hyster Co.**, Portland, Oreg., **Thorsten B. Pearson** was named administrative assistant and **Wilton G. Smith** was transferred from the eastern division sales department to head up industrial truck promotional activities.

At **Goodyear Tire & Rubber Co.**, Akron, **Charles R. Howard** was named manager of the engineering purchasing section to succeed **J. J. Wyle,** transferred to Goodyear Aircraft as assistant purchasing agent. **V. L. Petersen** was named manager, chemical and pigment section of Goodyear Tire purchasing operations.

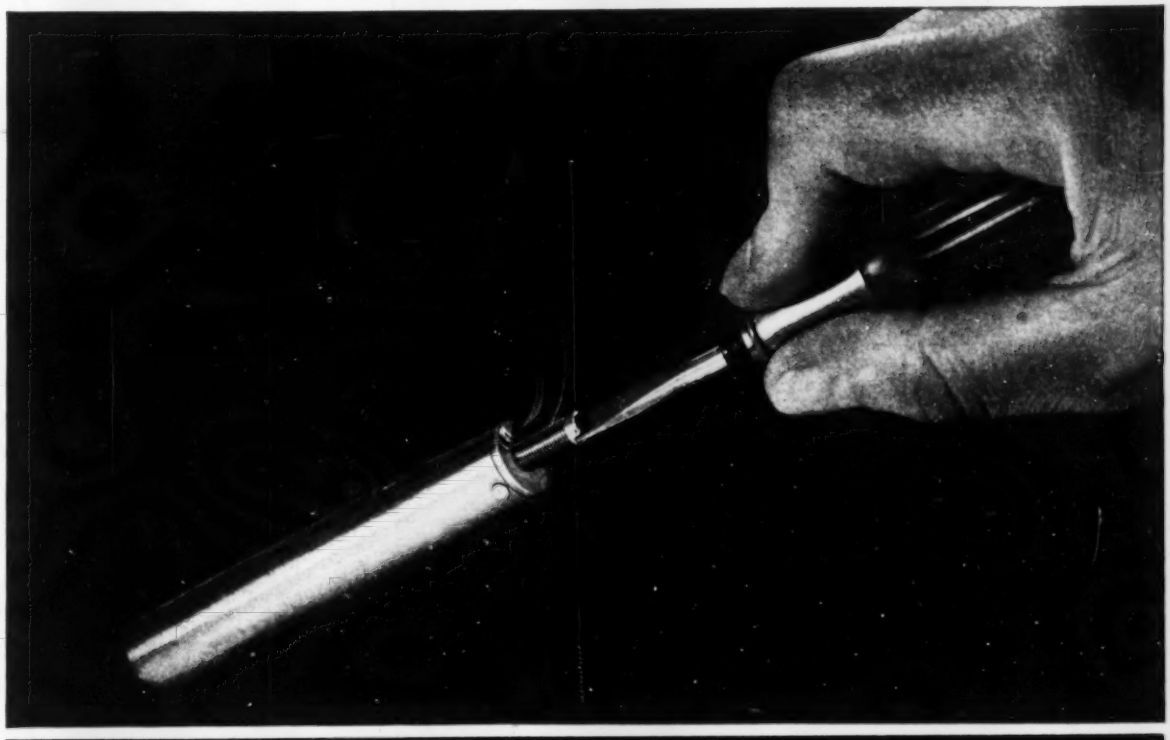
Irving A. Duffy was elected to the board of directors and a member of the executive committee, **Ford Motor Co.**, Dearborn, Mich. He has been vice president-purchasing and a member of the company's administrative committee since December, 1949.

Hudson Motor Car Co., Detroit, appointed **W. W. Sawdon** assistant general superintendent of its Wright Aeronautical Corp. manufacturing operations.

Don F. Shook succeeds **Otto G. Gundel** as president, **Buckeye Brass & Mfg. Co.**, Cleveland. **Leon Disinger** continues as vice presi-

JOHN JEPPSON
. . . Norton vice president

HERBERT D. EUWER
. . . chief engineer, AC&F



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M. J. HARPER
. . . V. P. of a Rockwell div.

JAMES J. BRYAN
Detroit Harvester appointment

dent, general plant manager. **Alan S. Dale**, formerly vice president and director of Randall Graphite Bearings Co., was appointed vice president and general sales manager.

Clement Reeves was named sales manager, **Fawick Airflex Division**, Federal Fawick Corp., Cleveland. He succeeds **John V. Eakin**, appointed assistant general manager. Working with Mr. Reeves will be **K. R. Spelman** as assistant sales manager. **J. S. Walsh** becomes director of engineering and service, and **W. A. Franck** was made chief engineer.

Hydropress Inc., New York, elected **Wylie Brown** chairman of the board.

M. J. Harper was elected vice president and **H. Gottwald** as eastern regional manager of sales and district manager of the New York district office for the Meter & Valve Division, **Rockwell Mfg. Co.** Mr. Harper has been with the division for over 30 years as district manager of the New York office, and until his new appointment was regional manager of the eastern region. He will now work on special assignments and will headquarter in New York.

James M. Dehn joined the engineering staff of **Peter A. Frasse & Co. Inc.**, New York. He will serve as a field consultant on application, selection and fabrication of stainless steels.

James J. Bryan was appointed plant manager of **Detroit Harvester Co.**, Detroit Division.

Wettlaufer Mfg. Corp., Detroit, elected **Herbert J. Wettlaufer** vice president to handle administrative affairs. Mr. Wettlaufer resigned from Michigan Bell Telephone Co. after 27 years of service.

In the sales department of **Pittsburgh Steel Co.**, Pittsburgh, **A. S. Gardner** was made assistant to the general manager of sales, **Rudolph F. Schlentner** becomes assistant district sales manager, Pittsburgh district sales office, and **Richard D. Jenkinson Jr.** was appointed assistant product manager of sheet sales.

OBITUARIES . . .

Edward L. Wetstein, 66, vice president and sales manager, **Great Lakes Steel Corp.**, Detroit, died Jan. 24.

Karl H. Bronson, 59, director of advertising and sales promotion for the **DeSoto Division**, Chrysler Corp., Detroit, died Jan. 22.

Ernest A. Berglund, 55, a vice president of **Hydreco**, a division of New York Air Brake Co., Cleveland, died Jan. 20 while on a business trip in Florida.

Fayette Brown, 71, Cleveland industrialist and one time president of **Stewart Furnace Co.** and a director of **Interlake Iron Corp.** and other concerns, died Jan. 31.

Thomas S. Green, 66, connected with Norton Co., Worcester, Mass., for 35 years before retirement in 1950, died Jan. 25.

Alvin J. Hammer, 61, president, **H & H Scrap Iron & Metal Co.**, Wauwatosa, Wis., died Jan. 30.

Glen A. Herrick, 62, assistant plant manager, **Houdaille-Hershey Corp.**, Chicago, died Jan. 30.

Joseph Sherratt, 48, head of **Sherratt Brass Foundry**, Toronto, Ont., died Jan. 22.

W. Carter Moore, 48, eastern zone manager, x-ray department, **General Electric Co.**, Philadelphia, died Jan. 30.

Lynn E. Klatt, 46, purchasing agent and traffic supervisor for the products division of **U. S. Steel Corp.'s** Chicago district, died Jan. 21.

Vernon C. Genn, 59, general sales manager, Detroit Diesel Division, **General Motors Corp.**, Detroit, died Jan. 30.

Jacob Von Gunten, president, **Ohio Drilling Co.**, Massillon, O., died Jan. 25.

W. H. Bruening, 72, former president, **Bruening Products Corp.**, Rochester, N. Y., died Jan. 29.

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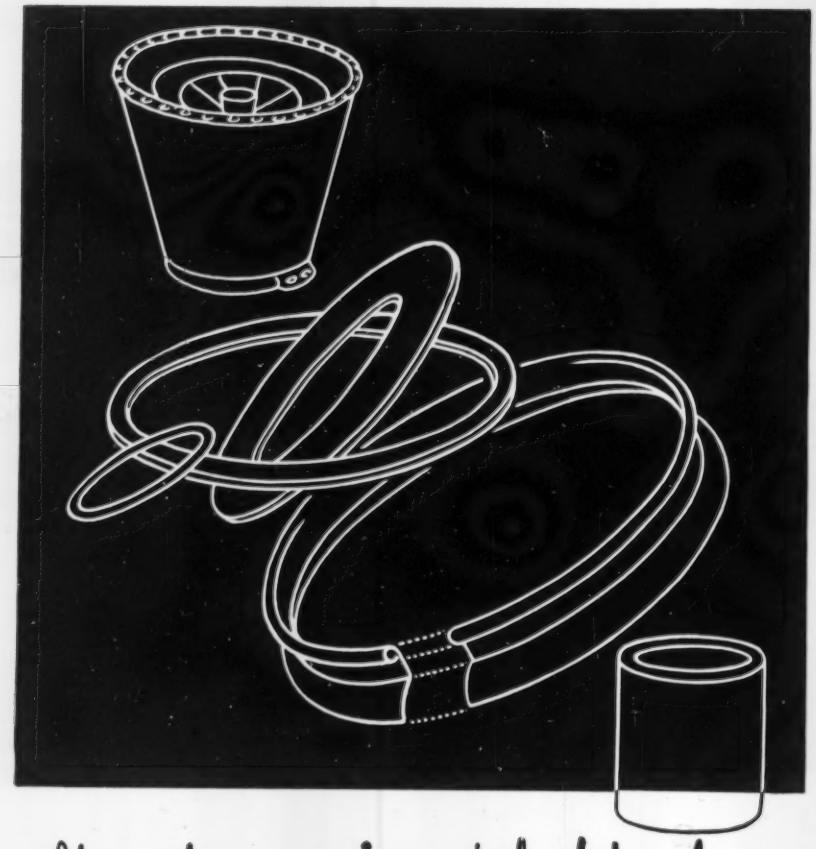

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Production AND Engineering NEWS AT A GLANCE

SQUEEZING ALLOYS—Scientists at Harvard have produced a true alloy by squeezing a mixture of metals under tremendous pressure into a chemical combination. This method may eventually be used to produce alloys from metals which cannot be combined by melting. A true alloy of bismuth and tin was made by subjecting the metals to a hydraulic pressure of 450,000 psi, converting a more or less mechanical mixture into a new chemical compound having certain properties differing from those of the starting mixture.

SHORT OF INFINITY—With industry leaning toward higher cutting speeds the question is often asked, "Just where is the top practical speed?" Some have felt that beyond some point high on the speed curve, there are speeds which would give exceptionally long tool life. Experiments at one company show that the cutting-speed, tool life curve behaves the same up through about 14,000 sfm and evidence is that there is no change above that point. There is however a practical way to figure the maximum speed to use on any job and it is based on the total cost per piece. Handling cost, cost of cutting and cost of changing cutters all go into the total cost figure. p. 88

MORE COKE COMING—The first of three coke batteries to be put into operation this year at U. S. Steel Corp.'s Clairton Works is now in action. A second battery will be placed into operation in about a month and the third is scheduled for May. The Koppers built unit uses 1400 tons of coking coal daily and produces 966 tons of coke for blast furnace use in Clairton and other U. S. Steel plants in the Pittsburgh district. In addition coal chemicals are recovered from the gas. The new gun-flue type battery is equipped with self sealing doors, newest type oven machinery and double collecting by-product gas mains.

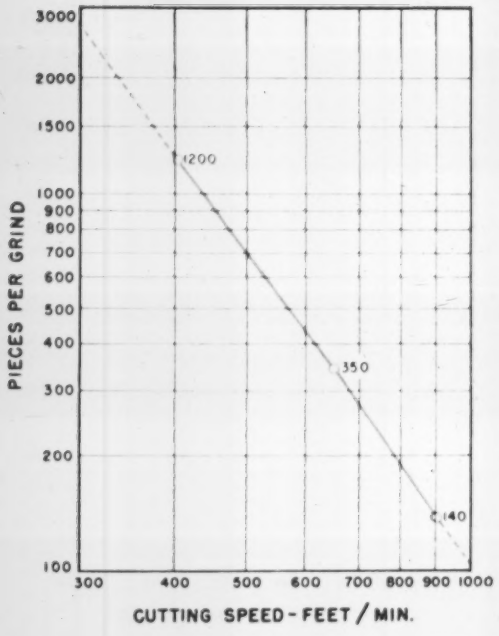
STAMPING SPEED—Broader use of high speed automatic presses may result from the installation of a 350-ton Henry & Wright dieing machine in the automotive industry. The machine handles metal up to 25 inches wide and 11 32-inch thick. Completely drawn and formed stampings are made in 13 operations by the progressive die method. Right and left hand parts for an automotive window control gear are turned out at the rate of 60 pairs per minute from 0.065-inch thick hot-rolled steel in coil form. Strokes up to 16 inches can be provided for producing straight shells up to 3⅜ inches long and tapered or hemispherical shells of greater lengths.

AND GETTING BIGGER—Tube reducing takes a giant step forward with the building of a new 18-inch machine. Growing out of the military demand for larger diameter, thinner walled tubing, the machine vaults the gap from 6½ to 18-inch tubes. Machine will be 100 feet long and made up of sections which are more or less independent of each other, but each performing an essential function in the operation. Four principal parts are the roll housing section at one end, tube feeding equipment in the center, the drive and the mandrel handling equipment at the other end. Principal part of the roll housing is the 150-ton saddle with its tolls, roll neck bearings, traveling wheels, etc. p. 90

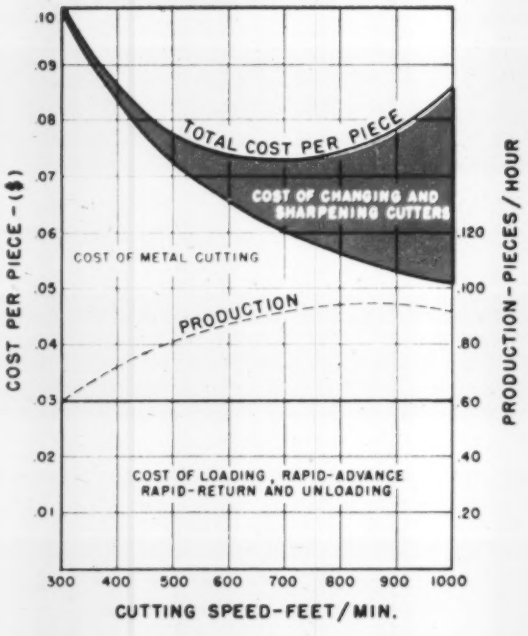
STRIP BEARING MATERIAL—A British patent has been issued for a strip bearing material in which aluminum alloy is used for both the rubbing surface and the backing material. A suitable alloy contains 86 per cent aluminum, 10 tin and 4 copper. The molten metal is poured into a rapidly revolving mold so the heavier ingredients fly to the outside leaving the lighter ones on the inner surface. After solidifying the strip is flattened and bent into the opposite curvature. The rubbing surface is thus soft and ductile while the backing is hard and strong. The two alloys gradually merge into each other across the thickness of the strip.

CUTS WARP—Organic resin bonding offers advantages by minimizing heat distortion. This is particularly important in joining work-hardened materials and age-hardening alloys where the bonding operation can be made at temperatures low enough that the softened heat-affected zone is not produced. These resins are tough, have excellent chemical resistance and are characterized by high adhesive qualities to almost any material. Common applications include bonding of various ferrous and nonferrous metals and alloys, ceramics, porcelain, glass, wood, plastics, asbestos and graphite. The resins are used in joining pipes and tubes, heat exchanger fins and in the fabrication of frames and cabinets. p. 92

TOOL TEMPERATURE—Misjudging the temperature to which a working tool or die is heated during operation is not uncommon. The heat is usually of a superficial nature and is not always evident by a heat color. Atlas Steels recommends taking a surface hardness reading and noting the temperature required to soften the steel to the value read. Take for example a punch heated to 45 46 Rockwell C that after a short run exhibited appreciable washing or metal flow. Surface hardness readings ran 31 32 Rockwell C indicating that the working surface had reached 1300° F in operation. The working temperature reached indicated the need for intermediate cooling and the selection of a tool steel capable of resisting thermal shock.



Log-log plot of tool life, measured in terms of number of pieces per grind, for various values of cutting speed



Increasing cutting speed first lowers then raises the total cost per piece as cost of cutter change rises

CUTTING SPEED: Horizons Limited

Jacking cutting speeds up to the sky doesn't necessarily lead to a production Utopia. There's an easy way to figure the fastest practical speed

By HANS ERNST
Director of Research
Cincinnati Milling Machine Co.
Cincinnati

HIGHER and higher cutting speeds have marked the course of machine tool history as new and improved machines and tool materials have been introduced.

In the last few years some investigators have urged use of cutting speeds even much higher than are now being used in commercial practice. Some have contended that just beyond these presently-used speeds lies a Valley of Death, which, if we only had the courage to cross, would be passed over to a promised Land of almost everlasting tool life. Is this fact or fiction?

As we see it, from observations of current practice, from carefully conducted tests and from fundamental considerations, the facts, as of today, are as follows:

Possible Boost—Throughout industry there are many machining operations on which cutting speed might be profitably increased. Too often the cutting speed for a given material and operation has been set in accordance with some generalized recommendation—or to provide some arbitrary value of tool life—which does not necessarily give the minimum cost per piece.

Criterion for effective machine operation is *total* cost per piece. For a given feed increment (per revolution, or per tooth) as the cutting speed is increased (with all other conditions constant) the tool life is decreased, thus causing an increase in cost on account of more frequent tool changing and sharpening.

In Balance — Optimum cutting speed in terms of minimum cost per piece, is therefore reached when the rate of decrease in cost caused by an increase in cutting speed is balanced by the rate of rise in cost due to the decrease in tool life.

Wherever the production volume on a given workpiece will justify it, the cutting speed should be determined from a careful analysis of all the cost-controlling factors.

How to Figure — Influence of these factors on the total cost per piece is illustrated by the following example:

Assume we are dealing with a simple face milling operation using a 4-inch diameter, 6 tooth, carbide tipped cutter, with a feed per tooth of 0.010-inch.

Three Tries — The workpiece might be a steel forging about 8

inches long, held in a quick-acting air operated fixture. In order to determine the approximate relationship between cutting speed and tool life, it is assumed that we have made several runs at each of three representative speeds, say 400, 650 and 900 fpm (with a constant feed per tooth) and have found that the average pieces per grind for these speeds were 1260, 350 and 140 respectively.

As might be expected these values fall approximately on a straight line when plotted on log-log paper.

Added Data—Assume also that we have determined the following facts:

Idle time per cycle (for loading, rapid advance, rapid return and unloading) equals 0.3 minute. Feeding distance (length of work plus cutter diameter) equals 12 inches.

Then feeding time per cycle in minutes equals:

Feeding distance × Diameter of cutter × π divided by Feed per tooth × No. of teeth × 12 × Cutting Speed, which equals:

$$\frac{12 \times 4 \times \pi}{0.010 \times 6 \times 12 \times \text{C.S.}}$$

$$\frac{210}{\text{Cutting Speed}}$$

Total time for cutting cycle (minutes) equals:

$$0.3 + \frac{210}{\text{Cutting Speed}}$$

If labor plus overhead on milling machine is $6.00 per hour, then milling cost per piece is

$$\left(0.3 + \frac{210}{\text{C.S.}}\right) \times \frac{6}{60}$$

$$0.03 + \frac{21}{\text{C.S.}} \text{ dollars}$$

Change Time—If average time to grind cutters is 30 minutes, and if labor plus overhead on cutter grinder is $4.00 per hour, then cost for changing and sharpening cutter is:

$$\left(15 \times \frac{6}{60}\right) + \left(30 \times \frac{4}{60}\right) = \$3.50$$

and cutter changing and sharpening cost per piece is:

$$\frac{3.5}{\text{No. of pieces per grind}}$$

The *total* cost per piece for any given cutting speed and corresponding number of pieces per grind is therefore:

$$\$\left(0.03 + \frac{21}{\text{Cutting speed}} + \frac{3.5}{\text{Pieces per grind}}\right)$$

Best Speed—In this case it is evident that optimum cutting speed (for minimum cost per piece) is in the neighborhood of 700 fpm as shown in the graph. However, a somewhat higher cutting speed (with corresponding feed increase) may be used to obtain higher production with only a small increase in cost per piece.

Illustration also shows rapid traverse and loading cost, actual metalcutting cost and cost of cutter changing and sharpening. These items add up as shown to give total cost per piece. Influence of cutting speed on production, in terms of number of pieces per hour, is shown by the dotted line.

High Ceiling — For commonly used aluminum alloys it appears that the optimum cutting speed lies well above the values which, because of other mechanical limitations, are now commercially obtainable. At speeds of 15,000 fpm the tool life is still very high on most of these alloys.

Second reason why presently used cutting speeds are often too low is that sufficient care is not always taken to insure the best possible operating conditions.

Cutting Environment — For the same tool life, in many machining operations the cutting speed and production could be increased if the workpiece were supported more rigidly; if there were less vibration; if the feed and tool angles were adjusted to their optimum values; if the tools or cutters were correctly sharpened; if an effective cutting fluid were used and properly applied and if the microstructure of the work material were controlled by specification or by heat treatment to provide the highest possible degree of machinability consistent with other required physical properties.

Large increases in optimum cutting speed have been made by proper control of microstructure of the work material.

Hidden Valley—When plotted on log-log paper the relationship between cutting speed and tool life appears as a straight line. In recent years, however, the question has been raised as to whether the direction of this curve might perhaps be reversed at exceedingly high values of cutting speed — whether there really is a Valley of Death for a given set of operating conditions beyond which tool life would again increase if the cutting speed were increased.

As part of our research in this field, several investigations have been made to explore the region of very high speeds on various types of steel and on cast iron. Thus far, up to a speed of about 14,000 fpm on all these materials, no such Valley of Death has been discovered.

CHECK THESE

If your answer to any of these questions is "No" you may be overlooking a way to step up speed without a decrease in tool life.

1. Is the workpiece rigidly supported?
2. Is the setup and mechanical condition of the machine as vibrationless as possible.
3. Are feed increment and tool angles adjusted to their optimum values?
4. Are tools or cutters correctly sharpened?
5. Is an effective cutting fluid being properly applied?
6. Is the microstructure of the work material controlled to give best possible machinability considering other physical requirements?

Powerful Giant Will Reduce 18-Inch Tubes

Preliminary design work completed on machine to produce world's largest light-wall seamless tubing by cold reducing method. It will dwarf all existing machines

By GRAHAM B. BROWN
Administrative Engineer
Tube Reducing Corp.
Wallington, N. J.

PICTURE a machine capable of moving three fully-loaded freight cars 3 feet forward and 3 feet backward in the space of two seconds and you have some idea of the magnitude of the 18-inch cold reducing tube machine being built for Tube Reducing Corp.'s Wallington, N. J., plant. Largest reducer to date takes an ingoing tube of 6½ inches OD.

Preliminary design investigation for the 18-inch machine established roll diameters in the range from 45-50 inches and maximum rolling load was found to be about 3.5 million pounds. With these determined, detail design of the machine became a joint project of Tube Reducing Corp. and E. W. Bliss Co., in whose hands work is now progressing.

General Layout—Machine will be 100 feet long and made up of sections which are more or less independent of each other, but each performing an essential function in the operation. Four principal parts are the roll housing section at one end, tube feeding equipment in the center, the drive, and the mandrel handling equipment at the other end.

Principal part of the roll housing is the 150-ton saddle with its rolls, roll neck bearings, traveling wheels, etc. Maximum travel of the saddle during reducing cycle is about 7.3 inches, enough to rotate the rolls slightly less than 180 degrees.

Frame Preloaded—Saddle frame extension caused by large separating forces between the rolls during a pass has been compensated for by compression preloading the frame. The four corner posts through the housing contain calrod units in the center and at the top so that they can be expanded lengthwise by heating. In assembly, the nuts on top are drawn down snug on the expanded posts and the posts cooled. Thus, this preload must be exceeded during the rolling for a separating strain to exist in the saddle.

Top roll position is fixed securely with respect to the pass line, and the bottom roll is adjustable vertically toward the pass line by hydraulic cylinders acting somewhat like jacks under the roll bearing chucks. As the dies roll face to face, it is possible to preload the hydraulic cylinders to maintain a preset position of the roll to a maximum separating load. Pump and accumulator to load these cylinders is mounted on the saddle and travels with it.

Rolls and Bearings—Final size of the rolls was determined at 50 inches by the center distance required to permit use of roll neck bearings large enough to support the rolling loads of 3.5 million pounds. Rolls are not sufficiently rigid to prevent flexing, since this can be compensated for in the pass design. Double roller spherical bearings are used to permit such flexing.

The bearings selected are 48.0315 inches OD, 17.244 inches wide, and have a load rating of 3.2 million pounds. Tapered bore of the bearings matches that of the roll neck so that the bearings can be placed without pressing, expanded by hydraulic pressure, drawn into proper position on the roll necks, and relieved of pressure to properly preload radially. A shrink fit without heat or presses is thus obtained.

Insertable Dies—Use of an insertable die greatly reduces the cost of tooling for each size and makes possible the changing of passes on the machine without completely changing rolls. Each die will weigh approximately 7500 pounds, and be a fine grade through-hardening alloy steel, heat treated to provide a surface hardness of Rockwell C-60 to a case depth of $\frac{3}{4}$-inch.

The die is held in the roll by four 3-inch corner bolts. Forces tending to push the die out of the roll are counteracted by a large rectangular key in the periphery, wedged between the die and roll so as to resist the splitting forces on the groove.

Drive Data—The machine that would pull the three freight cars

mentioned in the opening paragraph is actually a pair of 13-inch hydraulic cylinders requiring 5400 gallons, or 100 drums of oil every minute at a pressure of 2200 psi. Each cylinder is driven by its own pump, equalizing lines maintaining co-ordinated movement.

Pumps are electrically driven through a 5:1 speed reducer with a flywheel on the high speed shaft. This flywheel works in conjunction with the saddle in that stored energy of the system alternately flows from flywheel to saddle and from saddle back into the flywheel. This conservation of energy makes it possible to use single 700-hp synchronous motors instead of motors as large as 7500 hp.

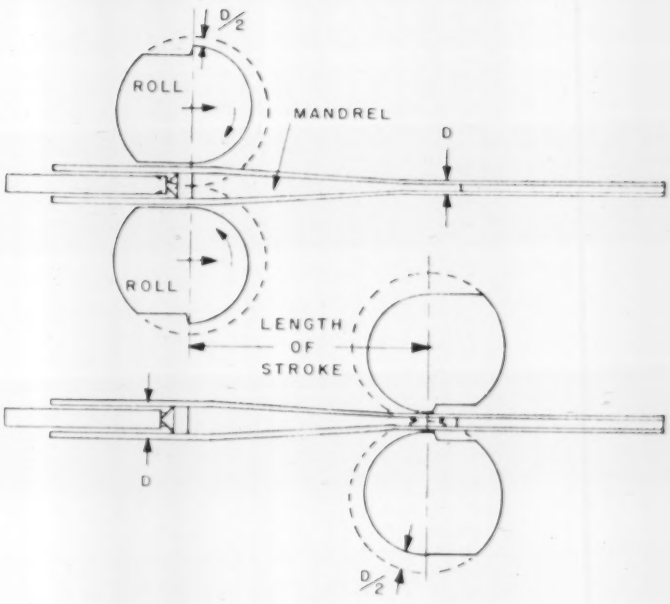
Tube Feeding—To keep the tube from moving forward in the roll pass, the end away from the rolls is firmly secured in a vise on the crosshead which pushes the tube into the rolls. The crosshead is advanced towards the rolls in increments preset in a range from 0.1 to 0.5-inch. Cams time this advance such that the increment of feed takes place immediately prior to each forward work stroke of the rolls, at the moment when the saddle comes to a stop to reverse direction.

Tube is turned at three points; at the crosshead vise, at a vise on the outlet of the machine and by means of the mandrel. All three are turned in unison by a 325-hp motor, as a relative motion would tend to apply torsional stresses to both tube and mandrel bar. This constant turning, in 60-degree arcs, prevents ovalation of the tube.

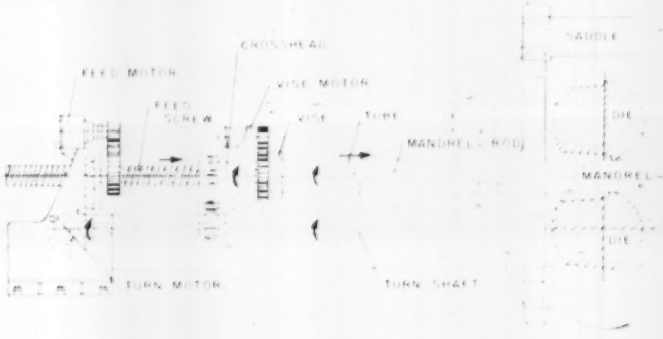
Finished Product — When completed, this machine will be capable of producing precision seamless tubing ranging in size to 17 inches in diameter, with walls as light or lighter than 0.125-inch in 10-inch tubing, 0.175 in 14-inch tubing, and 0.200 in 16-inch tubing.

This tubing will have the physical properties and the fine surface finish characteristic of Rockrite tubing. It will be of advantage for making cylinders, accumulators, casings, large ring-type parts, large volume pressure conductors or other thin-walled, high-strength applications.

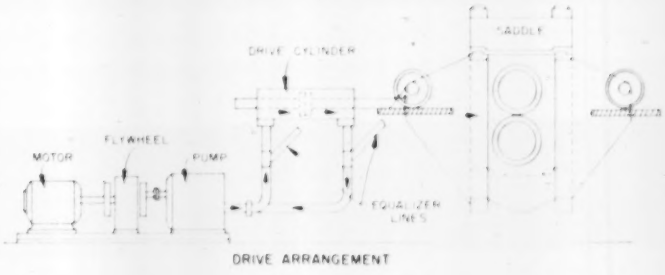
From a paper presented to the Rocket Committee of the American Ordnance Association, ASME, Nov. 5, 1952.



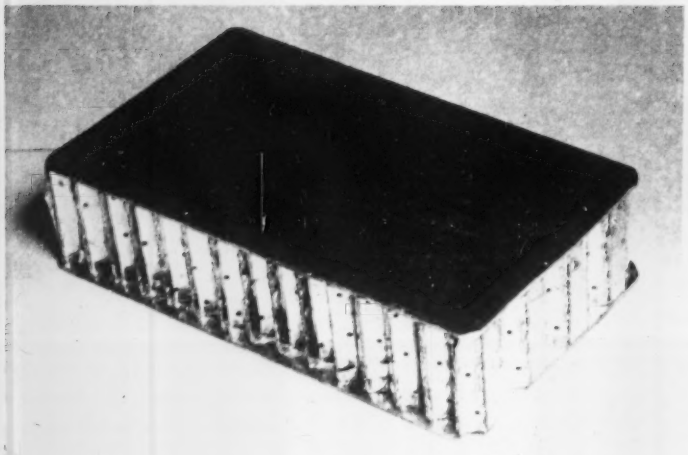
Cycle begins with rolls clear of mandrel so tube can be fed forward as required. Rolls move over mandrel, dies extrude metal forward

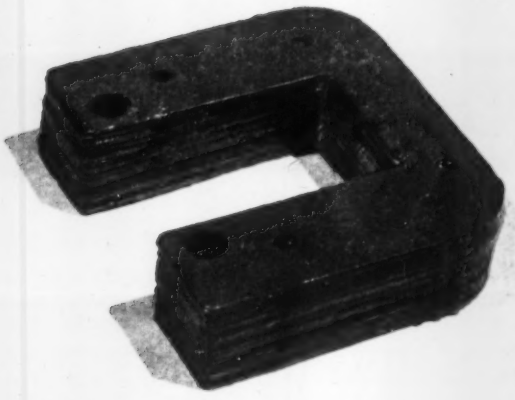


Layout of tube feeding and mandrel handling equipment. Vise in crosshead grips tube firmly, prevents forword motion, die jamming



Two 13-inch cylinders which drive saddle require 5400 gpm of oil at 2200 psi. A 750-hp motor drives pump through 5:1 speed reducer





Aluminum honeycomb section (left) for use in aircraft assembly and membrane constructed part (right) were resin bonded with ChemoTec

Joining Distortion Minimized

Low heat requirement of organic resin bonding eliminates heat-affected zone. Versatile method is readily adaptable to present production facilities

By HELMUT THIELSCH
Eutectic Welding Alloys Corp.
Flushing, N. Y.
and JOHN R. CHARLTON
Ciba Co. Inc.
New York

IN METAL JOINING, the no-heat or low-heat requirements of organic resin bonding offers advantages in some applications. In comparison with welding, brazing and soldering heat distortion is minimized.

This is particularly important in joining work-hardened (cold worked) materials and age-hardening alloys where the bonding operation can be made at temperatures sufficiently low that a softened heat-affected zone is not produced. In structures where light weight is important, such as aircraft, light gage, high strength, age or work hardened materials offer weight saving advantages.

Nonconducting characteristics of organic bonding agents are important in joining dissimilar metals and alloys exposed to environments which cause galvanic corrosion. Joints between copper and aluminum exposed to sea water and to other aqueous solutions are typical applications.

Foundation — Basic ingredients of a new group of organic bonding materials, known as ChemoTec, are ethozylene resins in which aliphatic, aromatic chain molecules, containing carbon-to-carbon linkages, have at their ends a reactive ethylene oxide group, characterized by carbon-to-oxygen linkages. Ciba Co. manufactures the constituents used in these bonding materials for the ChemoTec Division, Eutectic Welding Alloys Corp.

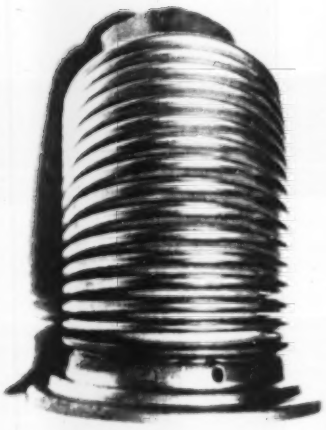
These resins are tough, have excellent chemical resistance and are characterized by high adhesive qualities to almost any material. Common applications include bonding of various ferrous and nonferrous metals and alloys, ceramics, porcelain, glass, wood, plastics, asbestos and graphite. The resins are used in joining pipes and tubes, heat exchanger fins, and as bonding material for office equipment housings, radio and television cabinets, window and door frames, paneling, containers and jewelry.

Varied Uses—The materials are applied as acid resisting bonding agents and sheath coverings for protecting electrical circuits and components against weather and moisture, as well as for insulation. They are used as potting compounds because they shrink little and have good mechanical and physical properties. Other applications are the embedding of resistors, capacitors and transitors in coils, transformers and miniature radio components.

One kind of ChemoTec bonding material can be applied at room temperature, using only contact pressure, but requires as much as 24 to 48 hours for complete curing. Another group can be cured in minutes or hours at temperatures ranging from 250 to 500° F.

Not Old — Although bonding of metals with organic resins goes back some thirty years, it was not until the recent war that organic adhesives found real commercial applications.

Let's take a look at the major types of commercial adhesive resins for joining metals. They may



Flexible rubber tubing resin bonded to brass flange for car radiator

be divided into three groups:

1. Rubber base resins; 2. thermoplastic resins, and 3. thermosetting resins. Among the thermosetting resins two groups of compounds are of major importance: 1. Phenolic resins and 2. ethoxylene resins.

Based on Rubber—In general, in rubber-base adhesives, which were among the first available commercially, the bond is obtained through solvent release, fusion or vulcanization. Because of the release of vapors, which may become entrapped as gas bubbles in lap-type joints, the use of most rubber-base compounds is rather limited for metal bonding applications. Other limitations: They may become brittle at sub-zero temperatures and may lose their strength rapidly at elevated temperatures. Once they have softened they generally will not regain strength on subsequent cooling.

Changeable — Thermoplastic bonding materials can be repeatedly softened (or melted) by increasing the temperature and hardened by lowering the temperature. They differ in this respect from the thermosetting bonding agents which change into a substantially infusible or insoluble compound as the result of the polymerization reaction.

Thermoplastic resins have the advantage that they melt easily, and in joining, can be applied like a solder. Their disadvantage is that they soften at temperatures considerably below their melting point so that, at best, they are used at temperatures only up to 150° F. Because of their relative softness, they exhibit poor creep strength even at room temperature. For example, a vinyl polymer adhesive which in a short-time tensile test might fail at 1000 psi, under a long-time load is likely to fail below 5 psi.

Permanent—Thermosetting resins will melt only once and will harden upon heating for a sufficiently long period of time at the proper temperature. Once they have been properly hardened, they cannot be remelted. They will, however, decompose upon exposure to temperatures exceeding certain limits, charcteristic of each material (usually varying between 150 and 500° F). The original strength developed by these materials is considerably higher than that of the thermoplastic materials. Since they do not soften with increases in temperature, over the recommended range of their application, they will exhibit good creep resistance.

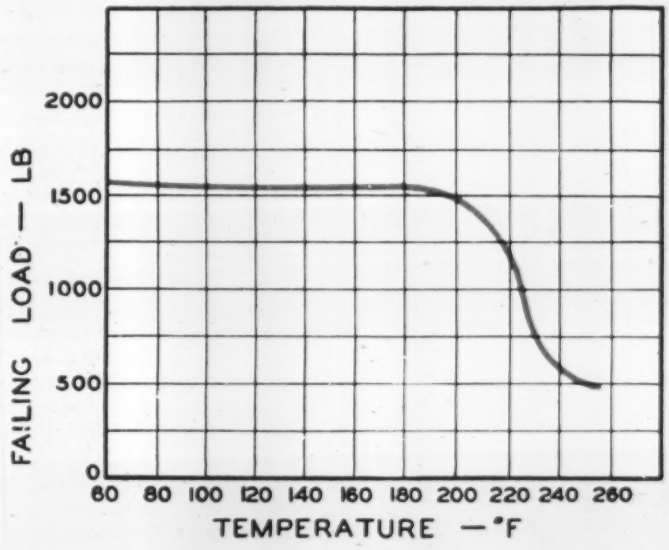
Heat plus Push — The bonding procedures of most of the commercial phenolic-type thermosetting resins consists of heating at temperatures between 200 and 500° F and applying pressures of 50 to 350 psi. The requirement of pressure in these materials is sometimes a serious commercial drawback, such as for large assemblies.

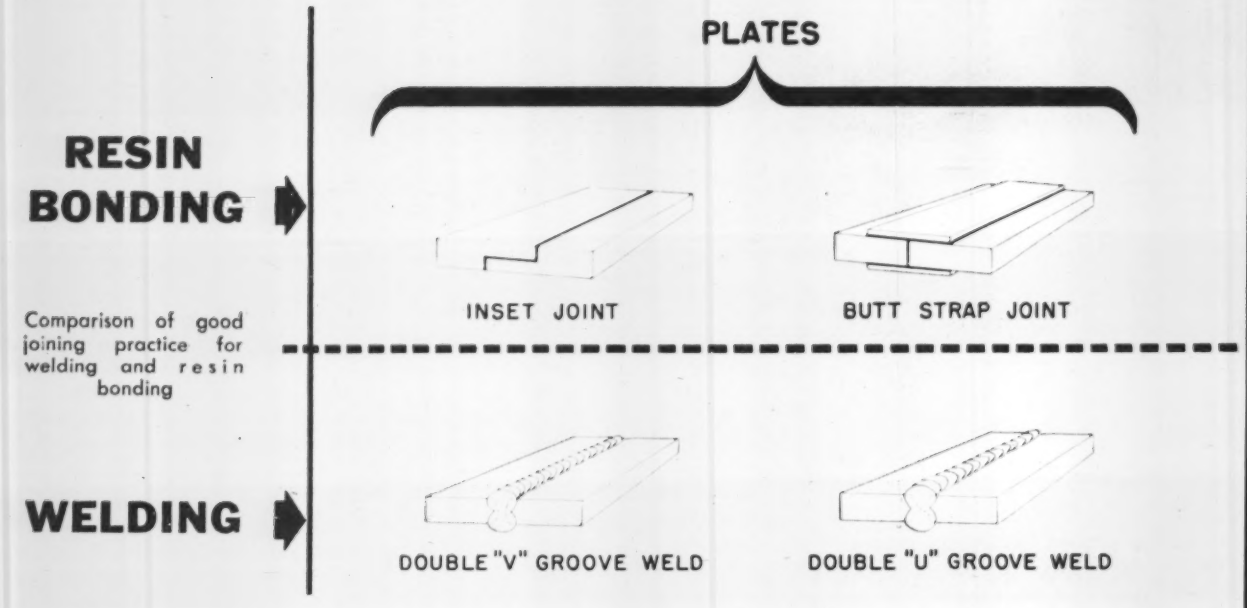
Many of the thermosetting resins during the polymerization reaction with the catalyst (hardener) produce a by-product. For phenolic resins this by-product can consist of water and an inorganic product such as ammonium hydroxide. In close joints, as in lap-joints, the presence of such by-products is undesirable, since they prevent the formation of a homogeneous firmly adhering bond. Some of the inorganic substances that form may seriously corrode the metal.

New Resins—The ethoxylene resins, basis of ChemoTec bonding materials, do not require pressure for bonding. No by-products remain after the reaction between the bonding material and the hardener.

The hot-setting bonding materials have a melting and curing range between 250 and 500° F. At the lower end of the range it is not possible to overcure them. For example, although about one hour at 350° F should ordinarily be sufficient to harden the bonding resins permanently, a 20-hour curing period at the same temperature

Joints made with hot-setting resin retain full strength up to about 220°F. Above that strength falls off as shown below





Comparison of good joining practice for welding and resin bonding

does not damage the material.

One of the factors to consider is the relatively long curing period required for these ethoxylene type bonding materials, which is somewhat longer than the period required, for example, by the phenolic resins. With modern, automatic ovens and other types of heating equipment, the hardening period required is fitted into production schedules. With baffled flames, resistance or induction heating, the required hardening period may be reduced to the order of minutes by raising the temperature to 400 to 500° F.

Molecules Grow—Polymerization or curing does to the bonding material essentially what solidification (crystallization) accomplishes in a metal. Small molecules or groups of molecules are combined into long chains and networks of random orientation. The process is characterized by "hardening" of the resin from an initially liquid state into a rigid, solid and permanently hardened material. A catalyst is used to activate and promote the chemical reaction.

Bonding materials are available for room temperature applications (cold setting) and for low-heat applications (hot setting) by means of different catalysts. In the hot-setting bonding materials the catalyst is already mixed into the material. It becomes active only after temperatures above 250° F are reached. Schedule below shows required curing time at various temperatures.

TIME	TEMPERATURE
24 hr	250° F
10 hr	275° F
5 hr	300° F
2 hr	325° F
1 hr	350° F
30 min	400° F
15 min	450° F
7-10 min	500° F

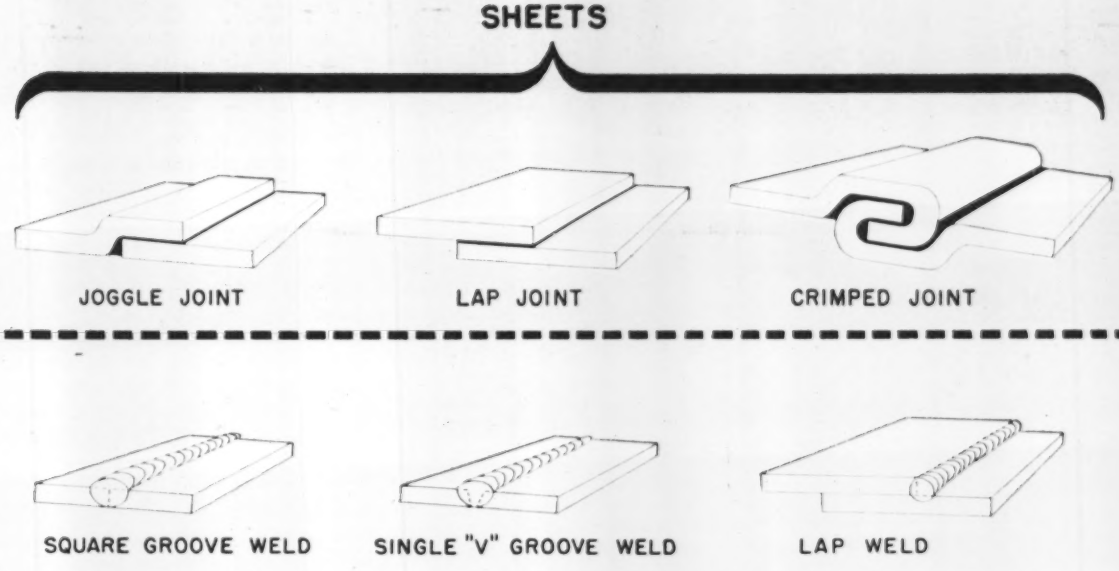
This hot curing schedule applies to both the solid and liquid bonding agents. The solid bonding agents, rods and powders become moldable at 100 to 120° F, spreadable at 190 to 210° F and free flowing at 250° F.

Breathing Spell—Between 250 and 300° F the bonding agents retain their free-flowing characteristics for about 30 minutes. This has the advantage that in this temperature range the materials can be applied on preheated metal sections and remain free-flowing for relatively long periods, during which the metal sections to be bonded can be positioned and air bubbles adhering to the metal surface or entrapped in surface cavities can escape through the free-flowing bonding material. However, because of the free-flowing characteristics of the bonding agent, it can be applied to only one of the mating metal surfaces.

In oven applications the curing period (temperature and time) is easily controlled. In other heating applications it is sometimes advisable to attach thermocouples to the material to be bonded.

Watchdog—A color indicator can be added to the opaque hot-setting bonding material used above 350° F. During curing the indicator changes its color from deep blue to apple green, indicating that polymerization has been completed. This is particularly important for heating processes such as flame, infra-red, resistance and induction, where accurate temperature control might not be possible. Overcuring is indicated by a change to brown from the apple green color.

In the cold-setting materials the bonding agent and catalyst are supplied separately. They have to be mixed in the recommended proportions immediately preceding their actual use. Complete bonding is obtained after about 24 to 48 hours at room temperature. If necessary, curing may be accelerated by slight heating so that at about 120 to 140° F 2 to 3 hours will be suffi-



cient; and at 210 to 230° F 30 minutes will be sufficient. However, in any case, it is important that 250° F is not exceeded.

Design Considerations — Just as different design considerations hold true for riveting, for welding and for soldering, organic resin bonding has its own particular design features.

For best results lap and socket joints should be employed (see illustration). The highest bond strength is obtained from close fitting joints with a 0.004 to 0.008-inch clearance. For pipe and tube joints the clearance should amount to about 0.005 to 0.010-inch. Moreover, in pipes and tubes of dissimilar metals the metal with the higher coefficient of expansion should preferably be on the outside. This keeps the bonding material under compressive rather than tensile stresses.

Rigid Hold—Pressure is not required to produce good bonding. However, clamping or jigging to hold the joining surfaces in place is advisable until curing has been completed.

Essentially the strength of the resin bond decreases with increasing overlap which is due to stress concentration at the ends of the overlapped bond area. This is illustrated in Table I, which shows that the shear strength decreases with increases in the overlap. The data in Table I show also that double-lap joints have a higher strength than single-lap joints.

The effect of sheet thickness upon joint strength of 1 in. wide 52 S aluminum shear-tensile specimens with an overlap (single-lap) of 0.5 in. is given in Table II. Curing schedule was 30 min. at 400° F. In all instances failure took place in the sheet outside the bond areas.

Heat Increases Strength — The joint strength depends upon the type of bonding materials. The hot-setting materials are approximately twice as strong as the cold-setting types. Surface roughness of the metals to be bonded also influences adhesion. Slight surface roughness is beneficial.

Joints made with the hot-setting products will retain their full strength up to about 212° F. Above that temperature the strength begins to fall off as is illustrated in graph for 1 in. wide 0.01-inch thick 52 S aluminum tensile specimens with an 0.5-inch overlap. In this case curing was completed by heating for 30 minutes at 400° F. Long time service above 250° F for resin bonded joints is not recommended. Soldering or brazing is preferred. Subzero temperatures do not embrittle

TABLE I

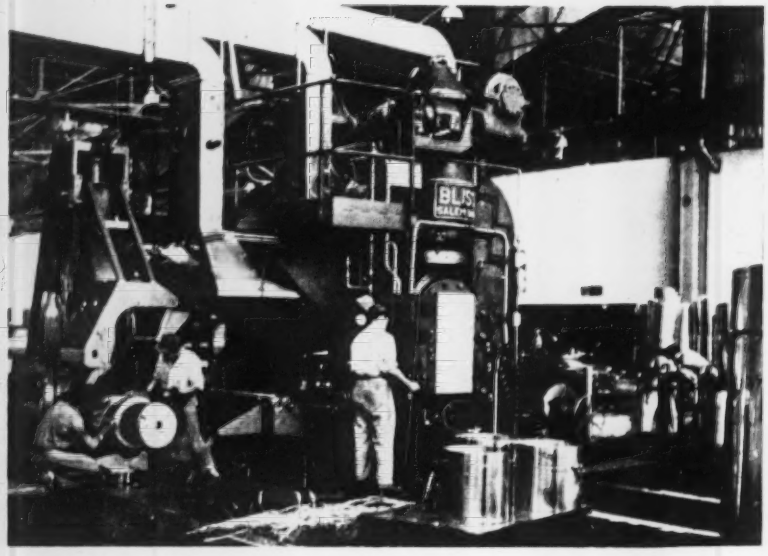
Effect of overlap upon shear strength of single-lap and double-lap shear-tensile specimens. (Sheet thicknesses: 0.0394-in.—0.0788-in.)

Overlap ratio (Overlap length/sheet thickness)	5	10	15
Single shear specimen (psi)	5100	4150	3150
Double shear specimen (psi)	7500	4850	3250

TABLE II

Effect of sheet thickness upon joint strength of 52 S aluminum shear-tensile specimens.

Sheet Thickness In.	Breaking Load Lb
0.02	639
0.04	1,845
0.08	1,990
0.12	2,270
0.20	2,700
0.32	3,195



Four-High Mill Goes South of the Border

Reported the first four-high mill installed in Mexico, this unit was built by E. W. Bliss Co., Salem, O., specially for Aluminio Industrial Mexicano, S.A. With intermediate and finish rolling of aluminum alloy coiled sheet stock in mind, the mill is equipped to give 50 per cent reduction at speeds to 350 fpm. Twelve Torrington bearings are used to support work rolls and back-up rolls

and lower the strength of the material. In fact a slight strengthening has been observed in shear tests at −5° F.

What to Use—Hot-setting bonding rods are primarily suitable for bonding of small areas, where one or several pieces are to be joined. Prior to the application of the resin rod, the metal should be preheated to approximately 250 to 300° F.

Hot-setting bonding powders may be applied with a sieve upon cold or heated metal surfaces which have been preheated to 250 to 300° F. Masks should be used when only certain areas of larger parts are to be bonded. This should be followed by the desired curing time-temperature cycle.

Large metal surfaces and materials such as glass fibers may be coated by means of suitable flame spraying procedures, using spray guns similar to those employed in powder metal spraying.

If Parts are Large?—The liquid hot-setting bonding agents are particularly suitable for the treatment of large surfaces and for the application of very thin layers at room temperature. Brushing, spraying and immersing procedures are most commonly used. The liquid bonding materials contain organic solvents. Prior to joining the surfaces, to which the bonding material has been applied, the solvent is allowed to evaporate by means of pre-drying. The bonding operation between 250 and 500° F may be made immediately upon pre-drying or may be postponed for weeks or months.

In this manner the surfaces to be bonded may be coated or stored until it is convenient to make a production run.

Pastes Too — The hot-setting paste products are generally applied to small cold surfaces by means of a spatula. Upon subsequent heating to temperatures above 250° F the paste material becomes fully liquid and exhibits greater free-flowing characteristics than the liquefied powder and rod products would at the same temperatures.

The cold-setting liquid bonding agents, after mixing with the catalyst, generally are applied on relatively large surfaces by brushing or spraying.

The cold-setting paste products, after mixing with the corresponding catalyst, are particularly suitable for small areas where they are usually applied with a spatula.

Holding Down Corrosion

Stainless type shows ability to take it by handling hot H_2SO_4 for 3747 hours

SPECIAL corrosion-resistant stainless steel is proving itself under severe application conditions — extended exposure to hot sulphuric acid.

According to its manufacturer, Carpenter Steel Co., Reading, Pa., rods made from this steel resisted sulphuric acid solutions up to 58 per cent strength at 70° C. Length of service in the installation, made at a West Virginia firm's plant, now extends to 3747 hours out of a possible 6144 over a period of 256 days.

After a thorough inspection at the end of this period, the steel company reports no apparent corrosion whatever.

Operating Requirements — Steel used on this job is called stainless No. 20. Made in ½-inch rods, it handles about 50 gallons of H_2SO_4 a minute in a full solution range from 0 to 58 per cent concentration.

In the same application, another stainless type used in ½-inch round rods failed in about 4 days and the unit was shut down as a result.

The No. 20 stainless, successful in this installation, contains four elements designed to impart high sulphuric acid resistance. These, with their content, are 29 per cent nickel, 20 per cent chromium, 3 per cent copper and 2 per cent molybdenum.

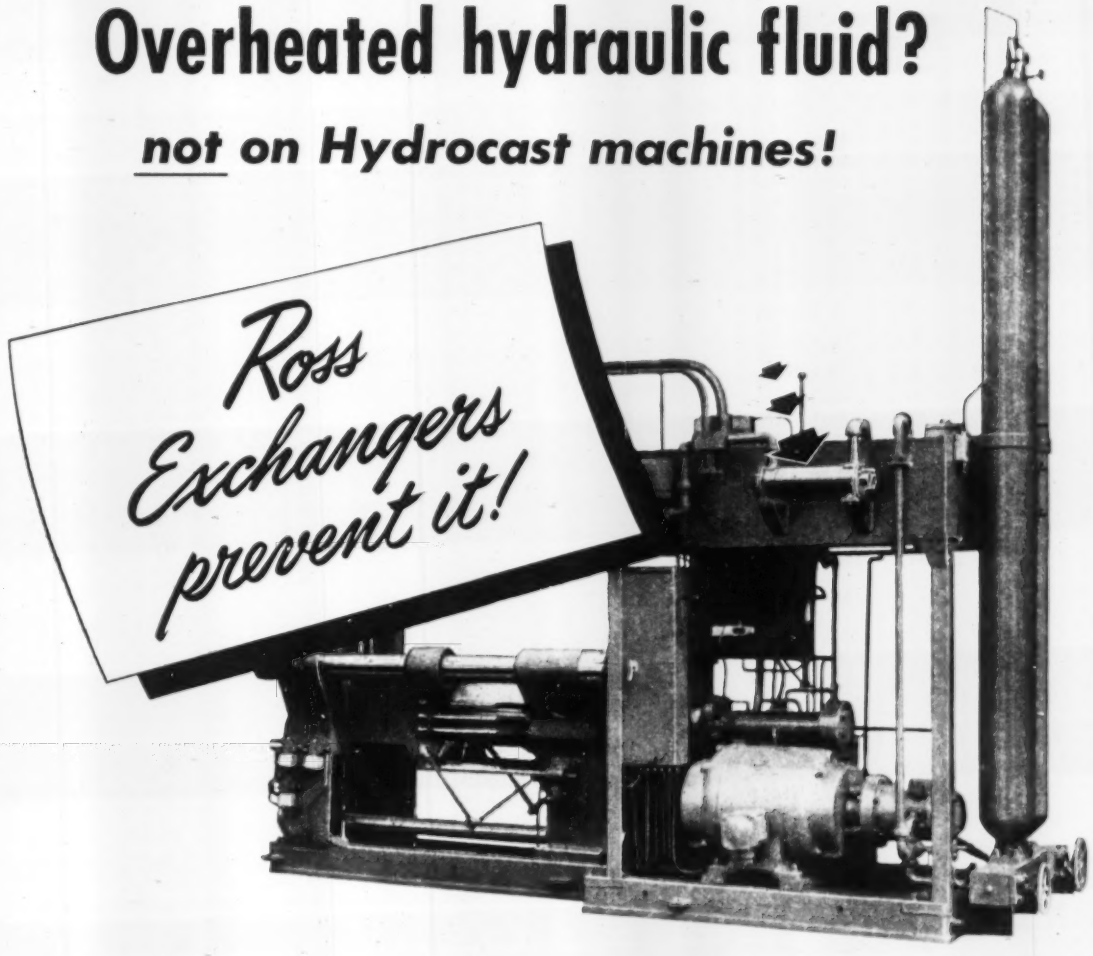
Broad Range—Carpenter reports its product has shown excellent resistance over a broad range of concentration. It is used in 78 per cent sulphuric acid at temperatures up to about 50° C and in all other concentrations at temperatures to about 80° C.

The product also provides useful resistance to boiling sulphuric acid solutions in concentrations up to 10 per cent.

Among applications, the firm cites use in manufacture of solvents, plastics, chemicals and synthetic rubber. Another advantage seen is in guarding against metallic contamination where purity must be maintained in product processing.

Overheated hydraulic fluid?

not on Hydrocast machines!



Small, compact and often unnoticed because they require so little attention, the Ross Exchangers on Hydrocast Cold Chamber Die Casting Machines nevertheless have a *big* responsibility. They put hydraulic fluid temperature in its place *and keep it there!*

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Hydropress, Inc., New York, designer and builder of Hydrocast machines, puts it this way: "We find that Ross Exchangers meet the requirements of our equipment quite adequately and they are working trouble-free." That applies not only to die casting equipment, but to other types of Hydropress machines as well: extrusion presses, pipe testing machines, combined belling, expanding and testing machines, for example.

Whether you build or buy hydraulic machinery of any description, you will find it much to your advantage to know more about fully standardized, all-copper and copper alloy Ross Type BCF Exchangers. Bulletin 1.1K5 will bring this information to your desk. Write.

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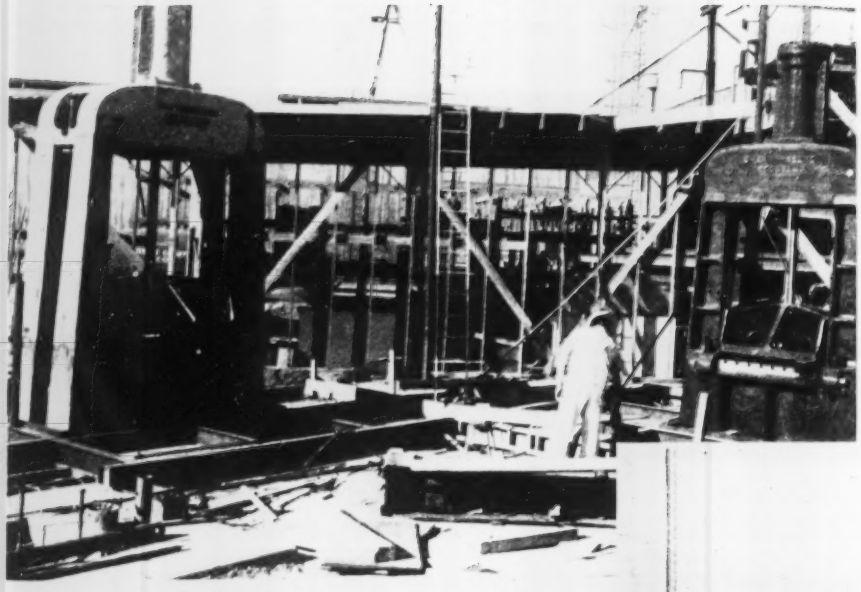

Network of reinforcing steel and supporting beams is arranged in pits prior to pouring concrete inertia blocks. These beams are suspended on twelve coiled spring sets

Plant damage and worker discomfort from the hammers' 106,000-pound punch are eliminated by use of floating foundations

FLOATING FOUNDATIONS Cut Hammer Damage

Steel coils form a vibration-absorbing cushion for 138,000-pound hammer foundations. Advantages include longer building and equipment life, reduced operator fatigue

SETS of coiled steel springs permit concrete block foundations to roll with the punch of two Chambersburg Cecostamp hammers installed recently by Ryan Aeronautical Co., San Diego, Calif. Blocks weigh as much as 138,000 pounds, but literally float on the springs.

Designed by Ryan's engineering department, the floating foundations minimize destructive vibration caused by hammer operation. Good insulation reduces employee fatigue and discomfort. Life of equipment and buildings surrounding the area, as well as that of the hammers themselves, is extended.

The hammers exert a top 106,000 pounds of force with each blow. This type of machine was mounted previously on a wooden wearing surface and bolted tightly to a fixed concrete foundation. Result was transmission of vibration, almost undiminished.

Time Lag Necessary—Ryan's design mounts the hammers on reinforced concrete blocks that rest in pits about 10 feet deep, 16 feet wide and 22 feet long. These masses momentarily absorb force of the haramer blows, interposing a time lag between impact and dispersion of vibration so full force is maintained.

Blocks are suspended on two rows of Korfund coiled steel springs placed along the bottom sides of the pits. Each cold-rolled crucible steel vibro-insulator can absorb 2800 pounds of force per inch of deflection. More than 100 are located in each installation.

In designing the vibration-absorbing foundations, the firm made sure that weight of the inertia blocks was great enough at moment of impact so elastic deformation does not occur. In addition, the blocks must come to rest before the next blows are struck. The mass and period of vibration must be controlled so amplitude of movement is within acceptable limits and acceleration does not exceed that due to the force of gravity.

Vibration Frequency—For physical reasons, the vibration frequency should be considerably different from that of the isolating

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ELECTRIC FURNACE ELECTRODES • SPLASH PLATES • RUNOUT TROUGH LINERS • MOLD PLUGS

medium. Reduced to a one-to-one ratio, the machine would be in resonance with its foundation, creating a dangerous condition that permits transmission of large amplitudes of motion and excessive force.

Planning the setup, Ryan engineers determined that total force transmitted to the foundation in the larger installation would be 342,500 pounds. This figure governed number and capacity of isolating springs used. In operation, the inertia blocks receive the impact, hesitate momentarily, then depress the supporting springs ¼ inch. The foundation oscillates until energy is dissipated through friction.

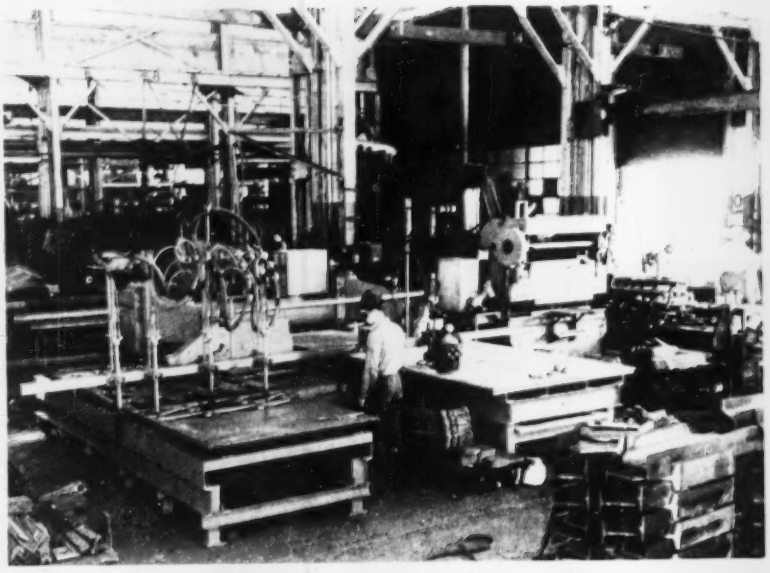
Coiled steel springs are a good elastic material because they can be designed precisely to deliver specific capacities. Characteristics depend on their dimensions, design and heat treatment not on varying materials. Steel springs have coefficient of less than ½ of 1 per cent, providing an advantage because dampening subtracts energy from the machine in the form of heat and places an added strain on the foundation.

Easy Maintenance—Machine operators are not inconvenienced by hammer movement although they stand on a floor cantilevered over the inertia block. Pits are made larger than the inertia blocks to provide good access for the springs when breakage occurs.

Another advantage reported by Ryan for this type of mounting is its facility for keeping machines in plumb. Under continued pounding, foundations for this type of equipment often shift, causing erratic work, pulverizing wearing timbers and damaging machine bases. The floating foundations makes possible perfect plumb by simple adjustment of leveling jacks at the location of each spring mounting.

Welding Advantages Cited

Physical advantages of weldments, design principles, economy factors and the firms' own facilities for this work are described in a 6-page bulletin issued by Continental Foundry & Machine Co. Copies are available from the firm's offices at E. Chicago, Ind., or 220 Grant St., Pittsburgh.



RIGID TEST FOR CRANE COMPONENTS
. . . closer tolerances, stronger fabrication result

Comparator Control Holds Production Standards

HUGE and apparently unwieldy parts required to put together power shovels and cranes can be misleading on the point of engineering precision practiced. Intricate design on components held to close tolerances must be practiced to assure proper fit.

This is borne out by procedure at Thew Shovel Co., Lorain, O. where the firm recently put to work one of the largest optical comparators ever manufactured to provide an exact check on accuracy of machined parts. This precise instrument magnifies part size and shape so any error can be seen instead of felt, as is true with most mechanical gages.

Magnified Shadow—The machine consists of a 30-inch diameter screen mounted on a pedestal and operated on the basic comparator principle. The comparator uses a parallel light beam directed on the receiving screen, where it can be inspected and measured by comparison with a master chart or drawing. Coincidence of magnified shadow and master chart outlines of the big parts can be checked readily for purposes of inspection.

A new flame-cutting setup is another equipment addition reported by the company, and designed to increase accuracy of fabrication. Based on the electric eye principle, an electronic tracer uses up to four oxyacetylene torches to cut steel plate parts on one table from an ink-drawn, glass-cloth templet on a second table.

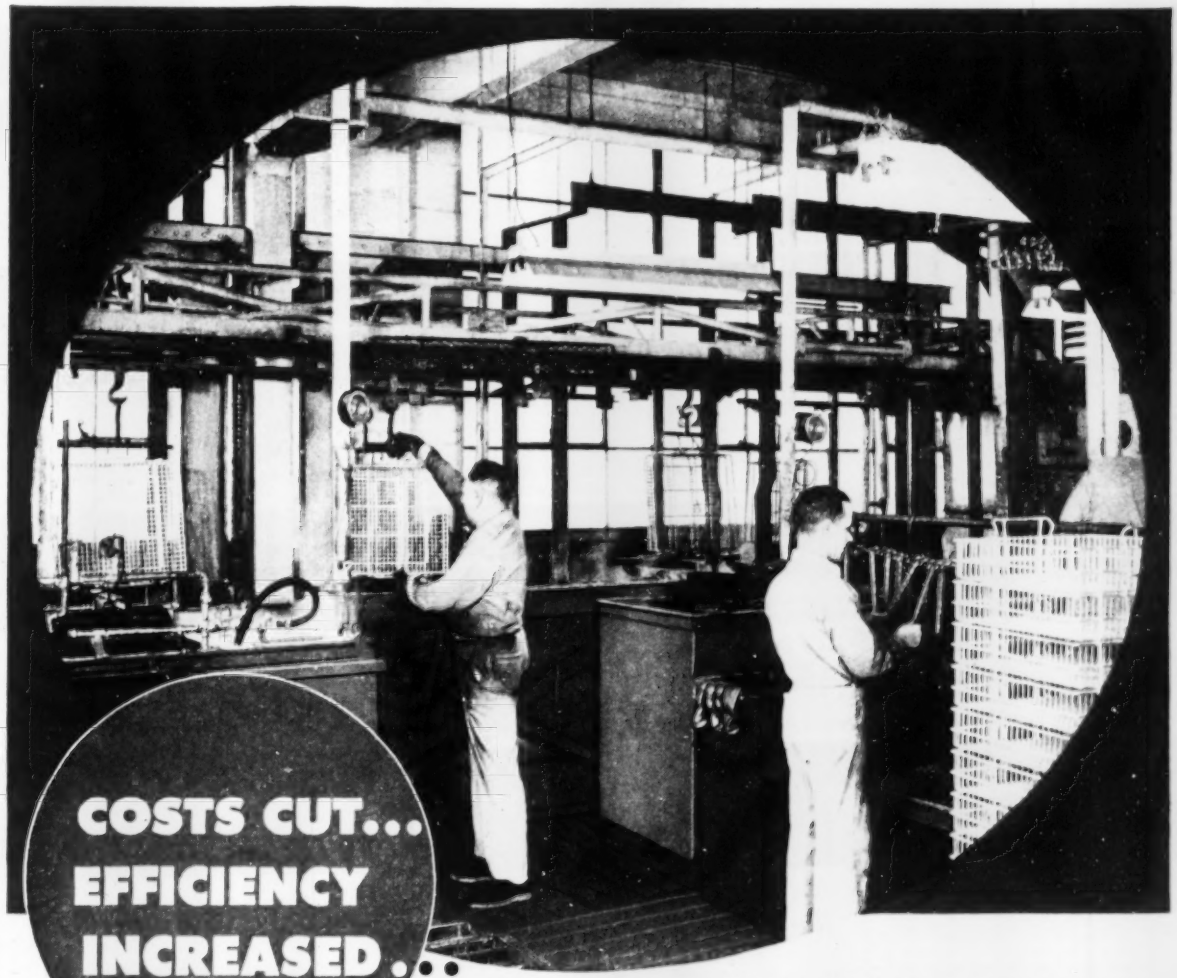
Parallel Stages—The electric eye follows the pattern on one stage while the arm-connected torches cut simultaneously on a parallel stage. According to Thew, stronger fabricated parts result because this electronic method holds to closer tolerances than does hand cutting.

Diffraction Course Scheduled

Spring session of the semiannual X-ray Diffraction School will be held at the plant of North American Philips Co. Inc., Mt. Vernon, N. Y. during the latter part of April. Exact dates and program details will be announced later.

Registration for the week-long school will be limited to 125 for the first four days and to 150 on Friday, the day devoted to actual application problems when guest speakers discuss details on methods currently in use around industrial laboratories and plants.

Monday through Thursday, the sessions involve extensive classroom and laboratory work.



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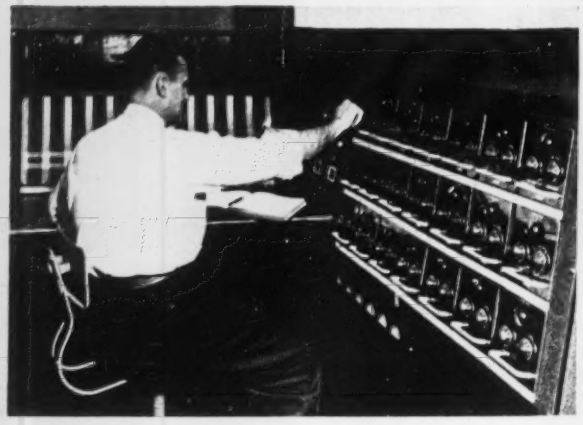


Samples of scrap are checked in spectroscopes to detect presence or absence of any undesirable elements that might affect the properties of a heat of tool steel

With the immersion Rayotube, correct temperature readings can be taken from the molten steel. Dry air blows the steel away from the electronic eye of the pyrometer

Close Checks Produce Top Tool Steels

To meet precision demands, producers must utilize the most modern testing devices at every stage of production. Close co-ordination between industry and users advances the art

By LEONARD C. GRIMSHAW
Manager, Steel Research
Firth Sterling Inc.
Pittsburgh

ANYBODY concerned with the manufacturing of machine tools and dies, realizes that the costs of machining, heat treating, and finish grinding usually far outweigh the cost of the tool steel involved. For that reason it is important to select the right kind of steel for the job, making certain that it is of first quality in every respect, and that it responds properly to heat treatment, lot after lot.

Steel manufacturers realize this also. Even though such tool steels comprise only about a tenth of a per cent of the tonnage produced by the steel industry, that tonnage is so important that mills devote great care to their manufacture and several mills specialize in nothing else.

Starts in Arc Furnace—These steels are invariably melted in electric arc furnace of small size 4 to 10 ton capacity hammered and rolled with great care, and then carefully inspected before shipment. Throughout this process are utilized the most modern devices and techniques for controlling the quality.

With "cold scrap" charge and electric furnaces, deoxidizing and refining of the steel can take place in accurately controlled temperatures. Furnaces are basic lined, which means that alloys in the scrap are recovered and used again. Scrap must be low in phosphorus, and tramp elements like lead, tin, zinc, copper, etc. must be excluded. All incoming scrap is therefore segregated as much as possible, each lot is sampled and the sample melted down in a small 25 pound induction furnace for chemical analysis.

Spectroscope Helpful—Detecting impurities with the spectroscope is a time-saver, and several of the tool steel companies have installed them. With a proper sample, it is possible to detect the presence or absence of any of the metallic elements.

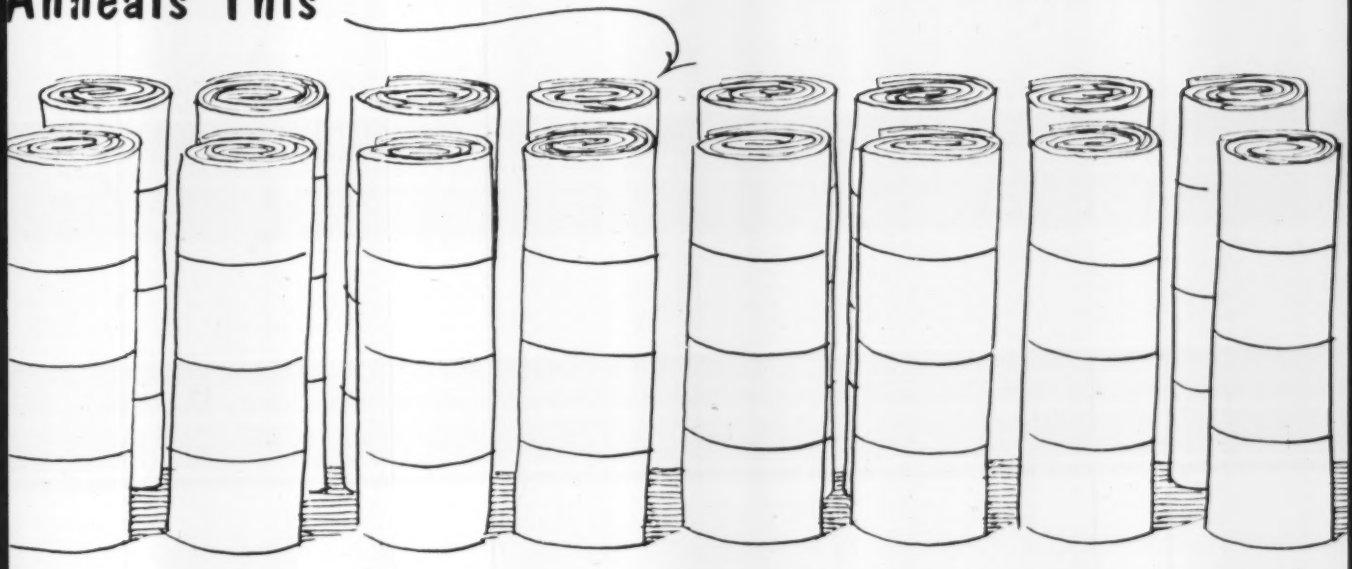
If more than a trace of some impurity is found, its amount may either be judged from the spectrographic results, or determined more exactly by chemical methods.

Knowing what is in the scrap tells the melter what alloying elements are short; these usually come from his own revert scrap or are obtained from ferroalloys produced outside of his plant. Economics sometimes dictate the reduction of ores or use of steel turnings that may be oxidized or covered with high sulphur cutting oil. These would be melted down and refined in a special heat and analyzed before being added to a tool steel charge.

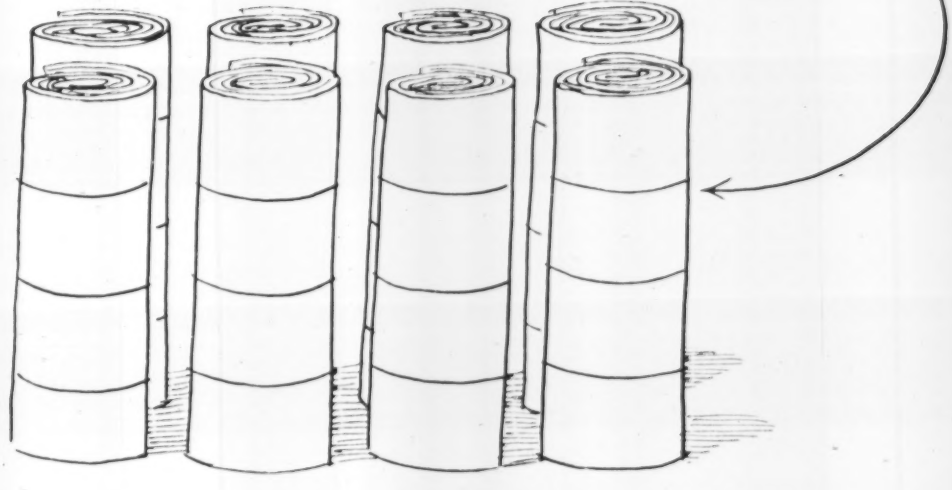
Temperature Control — Soundness of ingots and the quality of their surfaces depend upon accurate temperature control throughout melting and teeming. From the use of spoon tests and optical pyrometers, the tool steel industry has progressed to immersion thermocouples, or its companion, the immersion Rayotube. Properly used, these instruments give correct temperature readings of the

New LEE WILSON Single-Stack Portable Base System

Anneals This



While Conventional Multiple-Stack Furnaces (Same Space - Same Time) Anneal Only This



A Lee Wilson engineer can show you in a few minutes just how the amazing new Lee Wilson Single Stack Portable Base System can **double** your present annealing production without additional time or space.

And steel annealed by this revolutionary new system receives a better, more uniform and easier to control annealing.

If you are thinking about additional annealing equipment be sure you talk with a Lee Wilson engineer before you buy. We are certain you'll be glad you did.

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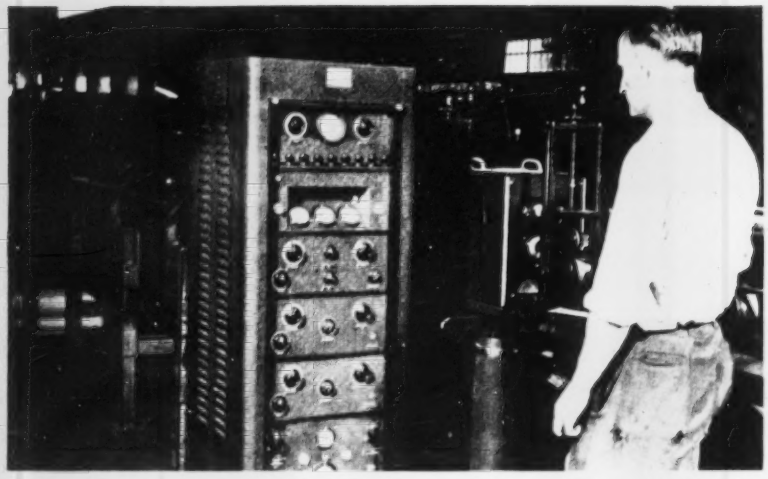

Magnetic analysis machines can detect surface seams, internal flaws. They also can detect mixed steel or separate mixed heats of some type of steel

molten steel, eliminating human judgment.

Platinum-platinum rhodium thermocouples have long been used for measuring temperatures in gaseous atmospheres, but it has taken much experimentation to protect such devices from attack by molten steel and slag. The Rayotube is actually an optical pyrometer that may be inserted into the molten steel, and that utilizes dry air to blow the steel away from its electronic eye.

Hot Topped Ingots — Big-end molds are used exclusively and all ingots are hot topped to confine the shrinkage pipe to the topmost part of the ingot. None of the tool steels, alloyed as they are, can have blowholes or pipe healed shut during subsequent hot rolling. In this they differ from low carbon rimming steel produced in the open hearth.

Care is taken to produce ingots with good surface, and experiments are constantly made to find better materials for coating the molds. By means of temperature control, and designing the molds to produce faster freezing, any harmful segregation in highly alloyed steels is being overcome. This reduces composition differences between the center and outside of large bars, with its effect upon response to heat treatment.

Close Control—Tests for special characteristics such as cleanliness of heat or hardenability are made from samples obtained from known locations in ingots poured at the beginning and end of each heat. These samples are forged down to small sizes and tested before the heat as a whole is processed. Then, for instance, if someone wants bars of shallow hardening carbon steel, they will be made from a heat of steel that is known to be shallow hardening.

Noticeable in a tool steel mill is the care that is taken in cooling the steel between each operation involving heating. Air hardening steels and large sizes of oil hardening steels often crack if they are not slowly cooled; if they don't during the cooling, they may during reheating for the next operation if they are allowed to get too hard. Controlled cooling also helps to prevent formation of internal "flakes" in some steels. Preventing decarburization of the surface is also a constant fight.

Initial Forging—Initial reduction in nearly all cases is by forging, a slower process than rolling but resulting in a better steel structure. During the forging the ingot top is cut off and discarded, since it may contain pipe and segregation.

After this initial hot working, inspection starts in earnest. Snag grinders remove surface flaws and imperfections that never heal themselves shut. Disks are cut from the ends of the billets and deep etched in hot muriatic acid solution to make sure that sufficient discard has been made and that the steel is internally sound. It has become common practice to further inspect all large and important billets, such as those destined for die blocks, with the supersonic Reflectroscope.

Spots Trouble Spots — This inspection tool enables one to probe the entire piece of steel with sound waves of supersonic length, and to see on an oscillograph screen whether these waves are reflected back from the opposite surface of the piece, as they should be, or are reflected back from some tiny void in the steel. If a void is discovered, it may be located in such a way that it will be cut out of the billet when it is cut to size.

After the tool steels are annealed to soften them and put them into the optimum condition for machining by the customer, the steel

Wire end or bar stock end inspection on a sampling basis is done on this Magnaflux unit. Operator is shown inspecting a short wire end for seams

The Eisenhower Inaugural Medal

is made of Lasting Bronze

WE ARE PROUD to announce that one of our customers is executing the official 1953 Presidential Inaugural Medal. The striking of over 10,000 replicas by the Medallic Art Company of New York City marks the return of this commission to private enterprise after many years of government manufacture. Walker Hancock, well-known American sculptor, prepared the original model from which the medal for General Eisenhower and the replicas were reproduced.

This memorable medal may be obtained for $7.00 from the Inaugural Committee, 1420 Pennsylvania Avenue N. W., Washington 25, D. C.

A special alloy of bronze, carefully prepared to exacting specifications, is being supplied for this medal from our mill here in Bristol.

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What is it?

A White Cloud?

No, it's the mashed potatoes you see in the picture at lower left. A micro-photo shows us the beauty and wonder of a commonplace thing we take for granted.

Ohio Ferro-Alloys are just about as commonplace to iron and steel makers as mashed potatoes. But behind each Ohio Ferro product lie many years of research and development and into each product goes the finest materials and workmanship.

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- RARE EARTH ALLOYS

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Supersonic Reflectroscopes test the soundness of steel billets by reflecting waves through the piece at any point. Voids can be easily located

is prepared for shipment. Straightening, cutting to length, etc. is followed up once more by inspection. In finished steel, surface is now as important as the internal condition was earlier. Surface must be free from slivers or seams; surface decarburization must be no greater than the specified amount; and, another final check on the grade is made to make certain there has been no mixup.

Other Surface Checks—Magnetic analysis machines, working on the principle of measuring magnetic permeability, are used to supplement bench inspection. In addition to detecting surface seams and internal flaws, such machines will detect mixed steel. They will even separate mixed heats of the same kind of steel, if set up with a standard of known analysis.

Magnaflux machines, both those using dry powder and the Zyglo method, are also used to supplement bench inspection for the discovery of seams and cracks. Many samples are cut from bars for the examination of decarburization and structure also. Microscopic study of polished and etched disks show both. Hardness tests are made to be sure that annealing was successful.

Close Customer Contact—In addition to these precautions, tool steel manufacturers keep in close touch with tool and die makers on special requirements; whether it be extra close tolerance, special restriction on decarburization, or special structure. Manufacturers constantly strive to develop new steels for applications where no known steels seems to be good enough, and are glad to be guided into lines of special research by tool and die makers.

It may be safely said that without the aid of tool steel users, and their insistence on better and better quality, there would have been little or no progress.

Chip Conveyor Cuts Shutdowns

By continuously removing the large volume of lathe chips with automatic scrap conveyors, Coit Road Works of Thompson Products Inc., Cleveland, eliminates periodic shutdown for manual scrap removal. Uninterrupted operation of the Sundstrand automatic lathes is maintained.

Called the Chip-Tote, the conveyor is built by May-Fran Engineering Inc., Cleveland. In this installation the conveyor is located directly beneath the lathe's tooling. Chips fall onto the hinged steel belting, are carried clear of the lathe's operating mechanism, then are transported up a 60-degree incline for discharge into tote boxes.

Coolant drains through the perforations in the belting and is returned to the reservoir at the base of the lathe. Power to operate the conveyor is supplied by an integrally-mounted electric motor and reducer through an adjustable clutch. If a load in excess of a pre-set limit is imposed on the conveyor belt, the clutch will slip to prevent possible damage to personnel and equipment.

Testing Services Listed

Eighty different methods for testing, inspecting and analyzing 90 types of products are listed in a folder distributed by American Standards Testing Bureau Inc., New York. Prepared to show industry and business the scope of services available to them for quality control, the folder touches several methods briefly.

These include nondestructive testing, testing for performance, corrosion resistance, protective coatings, chemical analysis, development of specifications and product certification.

Model Approach to Design

Lighter and more efficient transformers result from new approach to the problem

SUCCESSFUL method of determining transient voltages in transformers by using electromagnetic models has been developed by the General Electric Co.'s Power Transformer Department at Pittsfield, Mass.

The model testing method gains dividends in size and weight reductions in large high-voltage power transformers, according to Lynn Wetherill, the department's manager of engineering.

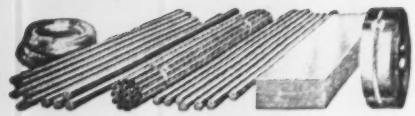
"Answers on voltage magnitudes and waveshapes, vital information to transformer designers, are supplied accurately and simply by testing a model before the transformer itself is designed," Mr. Wetherill says. These answers enable the designers to plan the construction of transformers with more efficient use of insulation and consequently exacting use of materials and space.

Many Advantages — The electromagnetic model reproduces faithfully the voltage magnitudes and wave shapes between any two points in a transformer, for applied waves of all types and for all transformer connections. Its applications include: Improved transformer designs; development of new winding structures; failure detection; and prediction of how a transformer behaves as a part of the power system.

Mr. Wetherill reports that on 11 models recently built and tested, 238 measurements were taken of maximum voltages between corresponding points on the models and on actual transformers. These showed an average deviation equal to only 4.3 per cent of the applied wave and to only 9.8 per cent of the voltage appearing on the transformer. This accuracy is more than adequate for design purposes, he points out.

Saves Expensive Changes—Models requiring only a fraction of the time and cost of a large power transformer will be built for most G-E transformers rated 100,000 kva and above, and all transformers having complicated winding designs.

Previously, to determine tran-



BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

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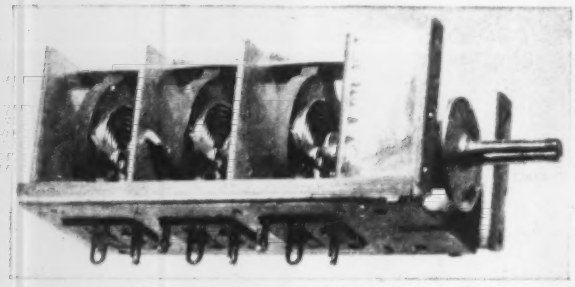


VHF Inductuner, courtesy P. R. Mallory & Co., Inc., Indianapolis, Indiana.

Designers of Electronic Components Prefer Copper Alloys

The complexity of modern radio and television equipment has radically affected the design of component parts. The electronic parts manufacturer, through careful design and choice of materials, is continually seeking methods for reducing the size and cost of his parts and to improve their quality.

VHF Inductuner

The illustrated, compact, highly efficient Inductuner consists of three small spiral wound coils ganged together. The inductance of each is simultaneously varied by rotating a common insulated shaft. Three silver-plated brass collars are clamped to the shaft. Riveted to each is a silver-plated, movable contact arm with a grooved tip which follows the spiral of the coil, pivoting as the diameter of the coil changes. A stationary contact arm maintains constant pressure against one side of the rotating collar. This contact arm is riveted to a brass input terminal. The other input connection is made through another brass terminal which is soldered directly to the inside end of the coil.

All brass parts are silver-plated to improve conductivity and resistance to corrosion. Being non-magnetic, they do not affect the magnetic field around the coils.

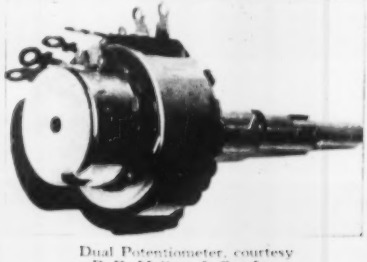
A free-cutting brass bushing, fastened to the frame, serves to guide the shaft and also acts as a spacer, positioning six metal stops. To keep the stops from separating, a brass washer, spring temper, exerts a slight pressure against them.

Brass Shaft Combines Potentiometers

Two separate circuits can be mechanically controlled by using a dual potentiometer for space saving and cost reduction. The front unit is operated by a hollow brass shaft made from free-cutting brass rod (alloy 6). The rear unit is operated by a solid shaft which passes through the hollow brass shaft. Both shafts are contained within a threaded free-cutting brass bushing which is used to fasten the dual potentiometer to the chassis.

The excellent machinability of free-cutting brass rod allows the bushing and hollow shaft to be held to close dimensions minimizing any play between the parts. At the same time, the low coefficient of friction of leaded brass prevents binding.

Within each unit a spring brass, silver-plated contact rides on a resistance strip exerting a uniform pressure as it is rotated. Any variation in conductivity due to variations in pressure, scratching of the resistance strip, or corrosion could seriously hinder the proper operation and life expectancy of the unit.

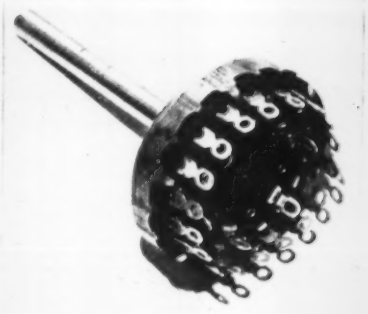


Dual Potentiometer, courtesy P. R. Mallory & Co., Inc.

Compact Rotary Switch

This 6-pole, 3-position rotary switch is compactly designed for maximum efficiency and long life. Mounted on a stationary laminated phenolic disc are 24 contacts made of Cartridge Brass (70% copper, 30% zinc), silver-plated for lower contact resistance.

Six small phosphor bronze, Grade A (95% copper, 5% tin, 0.15% phosphorus), silver-plated, movable spring contacts are located on another laminated phenolic disc which in turn is fastened to the shaft. When the shaft is rotated, the movable contacts bridge across the stationary contacts making and breaking the different circuits.



Rotary Switch, courtesy P. R. Mallory & Co., Inc.

A heavy phosphor bronze spring, fastened to the shaft, is designed to exert a constant pressure against the casing. Indentations on the casing index the shaft rotation to conform to terminal locations. A $\frac{3}{8}$-inch threaded bushing made from free-cutting brass rod is used to mount the switch.

Copper-Base Alloys – For Highest Quality

For highly functional, longer-lasting parts, copper-base alloys offer many advantages. The slight difference in cost, if any, is infinitesimal when figured on a unit cost basis. On the other hand, false economy or incorrect choice of materials will greatly reduce the life span and jeopardize the operation of the entire unit. Our laboratory will be glad to work with fabricators to help choose the proper copper-base alloys for specific needs. (9564)

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

Copper-Zinc Alloys vs. Sodium Hydroxide Solution Containing Hydrogen Sulfide

In last month's column we stated that pure sodium hydroxide solutions are mildly corrosive towards copper and copper-zinc alloys and that the higher copper alloys are more resistant to this attack.

However, sodium hydroxide containing hydrogen sulfide is much more corrosive as shown in the curve below. Here the order of merit is reversed since the corrosion resistance of these alloys rises with decreasing copper content.

Modified Copper-Zinc Alloys

At the bottom of the curve, data for a few modified brasses are also shown. The addition of 2% aluminum and .02% arsenic to 76% copper-22% zinc alloy has improved its corrosion resistance and the added elements have an effect equivalent to 10% of zinc. This aluminum brass alloy has a corrosion resistance equal to the 66% copper-34% zinc alloy. The addition of small quantities of tin and arsenic also increases corrosion resistance in this medium.

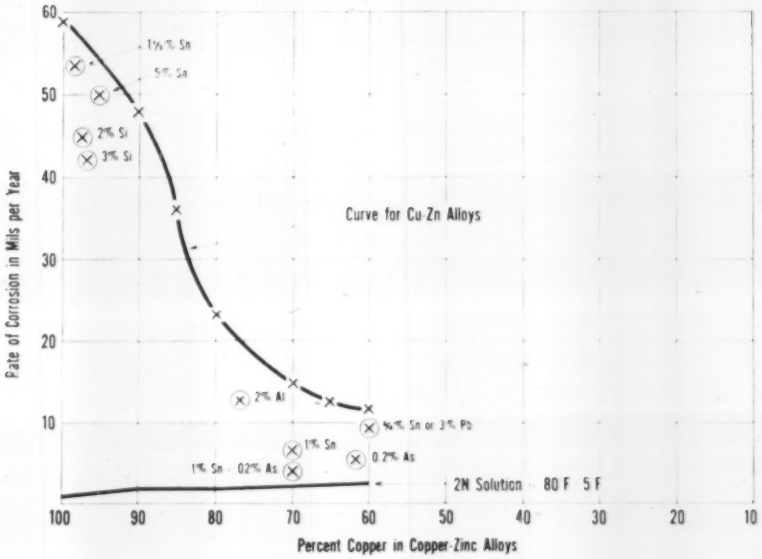
These laboratory data are in agreement with service data. Arsenical Admiralty (70% Cu, 29% Zn, 1% Sn, 0.02% As), which is the alloy showing the greatest corrosion resistance of all tested, is widely used in the form of condenser and heat exchanger tubes in petroleum refineries where hydrogen sulfide and mercaptans are the chief corrosive agents.

Copper-Tin and Copper-Silicon Alloys

Data for a few copper-tin and copper-silicon alloys have been plotted at the top left-hand side of the curve. The addition of silicon to copper has a greater beneficial effect than a corresponding amount of tin or zinc in the range investigated. The corrosion resistance of 97% copper, 3% silicon (silicon bronze) under these conditions is equivalent to that of the 88% copper-12% zinc alloy.

RATE OF CORROSION OF STRAIGHT COPPER-ZINC ALLOYS VERSUS MODIFIED COPPER-ZINC ALLOYS

Tested in boiling 0.8 N Sodium Hydroxide solution containing Hydrogen Sulfide and 0.5 N Sodium Chloride solution for 145 days. Solution changed weekly.



NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Chrome Carbide Gage Blocks are reported to have coefficient of expansion close to that of steel. This is said to allow critical measurements without correcting for differences in expansion between blocks and steel. Blocks are available in 1 microinch surface finish; 2", 3" and 4" blocks have bakelite grips to shield them from body heat. Blocks are reported to be light, non-magnetic and to wring easily in build-ups. **No. 1279**

Portable Nibbler weighing 8½ pounds is said to cut 14 gage metal of all types without distortion, other metals in proportion. Usable on DC or AC, 115 volts up to 60 cycle, nibbler has minimum cutting radius of 7/8-in., cast aluminum frame. **No. 1280**

Electronic Micrometer is said to measure directly to 0.00002-in. An accurate micrometer screw connected to a circuit reportedly sensitive to 0.000005-in. displacement at micrometer tip, gives visual indication at moment of contact, before pressure is exerted. Instrument is designed for research and testing where pressureless measurements are required. **No. 1281**

All Purpose Pallet of heavy-duty tubular steel is said to weigh less than a similar pallet of wood construction and is priced competitively. Two or more stout tubular skid runners are welded to a rectangular angle-iron frame which encases a laminated wood deck. Sled-like construction permits easy movement over uneven surfaces, and is adaptable for conveyor systems, storage racks of any design. Pallet is produced to customer's specifications. **No. 1282**

Portable Drill Guide attaches to air or electric drills by means of garter spring. Circular level is said to show operator exact vertical position of drill, and contact head calibrated in 5-degree divisions shows exact horizontal position of drill in relation to work. Guide is useful on portable screw drivers and riveting machines as well. **No. 1283**

Sheet Metal Power Notcher is said to save large part of cost of dies and heavy presses in some metal-working operations. Machine will make notches as large as 6 x 6 inches in 16-gage sheet. Is able to make notches larger and smaller than 90 degrees. Production rate is up to 180 strokes per minute, and machine is foot operated, leaving both operator's hands free for work handling. Work table is 12 x 18 inches. **No. 1284**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL

"Bridgeport" BRASS

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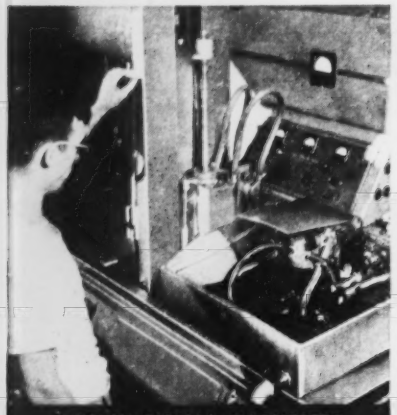

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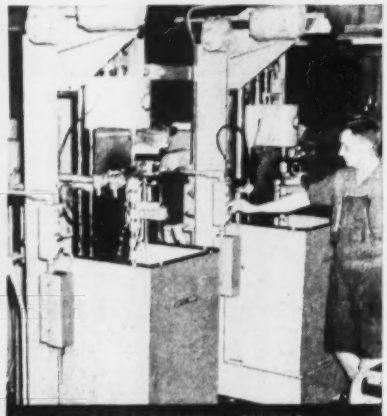
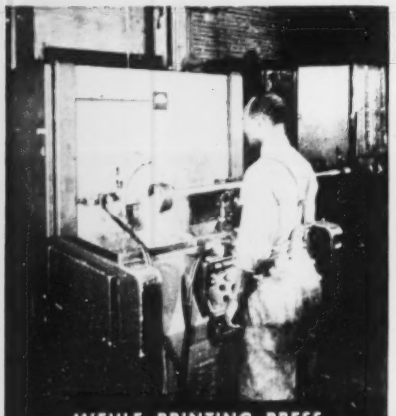


SACO-LOWELL SHOPS

from Presses to Planes



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YOU CAN BE SURE...IF IT'S Westinghouse

J-02255

Tubes Get Plug Test

Precision stainless tubing for aircraft control cables supplied by Superior Tube Co. is tested for roundness of bore by Teleflex Inc., N. Wales, Pa. Accurate test is assured by shooting a cylindrical plug through each piece by compressed air. Outside diameter of plug is only 0.005-inch under minimum inside tube diameter

sient voltages exactly, it was necessary to test the full-size transformer with a transient analyzer. Any changes indicated on a completed transformer were expensive and time-consuming. Attempts were also made to determine transient voltages in transformers by geometrical models and equivalent circuits. But the department reports these methods proved to have definite shortcomings. The electromagnetic model combines inductance effects of a geometric model with capacitance effects of an equivalent circuit to give accurate results.

Hydraulics Manual Available

Vickers Inc., Detroit, reports it has purchased the copyright for the Henry Ford trade school manual, "Hydraulics as Applied to the Machine Tool Industry." Manual includes information about hydraulic pumps and valves, and their maintenance and repair. In addition, it provides material on practical application of hydraulics to machines for control of speeds and feeds.

The firm says the manual will be available from its Product Service

For the story of FERROCARBO in quality steelmaking, mail the coupon today—or phone or write the FERROCARBO distributor nearest you. You'll learn why steel deoxidized with FERROCARBO is "plus steel."

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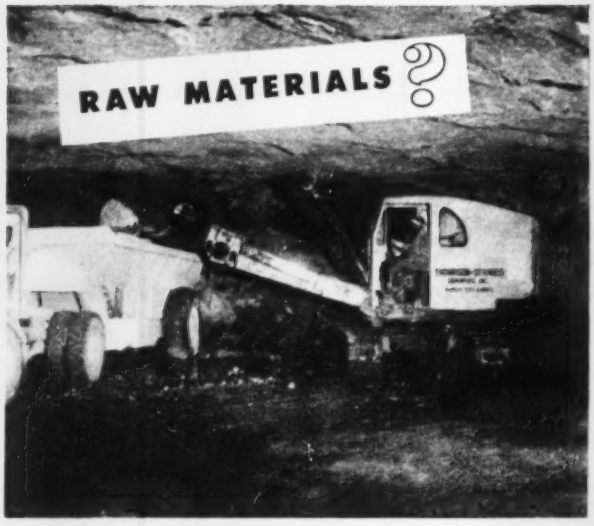
84-53

Q. Where does a LORAIN fit your picture?

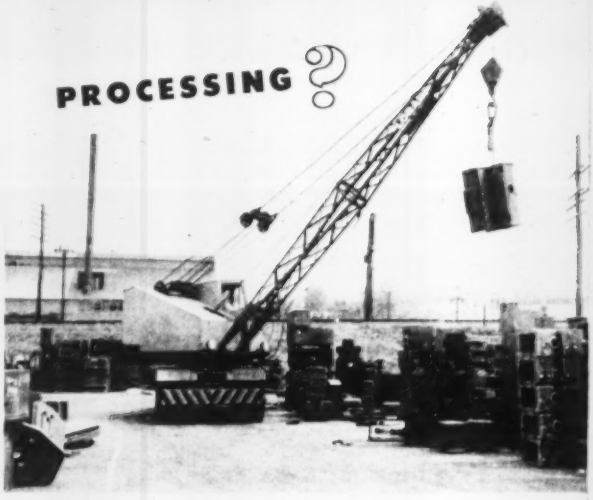


You name it! There's hardly a lifting, loading, material handling problem that cannot be handled profitably by Lorains.

These four pictures illustrate the point. From raw materials out of the ground to final product shipping, Lorains are serving and saving for thousands of industries. Many benefit particularly from the saving of high-speed mobility, the ability to move anywhere, any time, inside or outside the plant. Lorain rubber-tire mountings make that saving possible. There is another big saving in handling any size, type or shape of material. You can use bucket attachments to dig materials, or a wide assortment of more than 16 lifting devices to handle anything from wood crates to steel bars.

In addition to savings in time and manpower, you can streamline yard storage by higher stacking, fewer aisles and longer reaches with Lorain cranes. And there is an extra bonus in the work a Lorain can do on the many construction and maintenance jobs that confront every plant.

No matter whether your problem is raw materials, processing, shipping or plant maintenance, your local Thew-Lorain Distributor can provide you with money-saving, time-saving facts for your plant.



A. All the way—start to finish!

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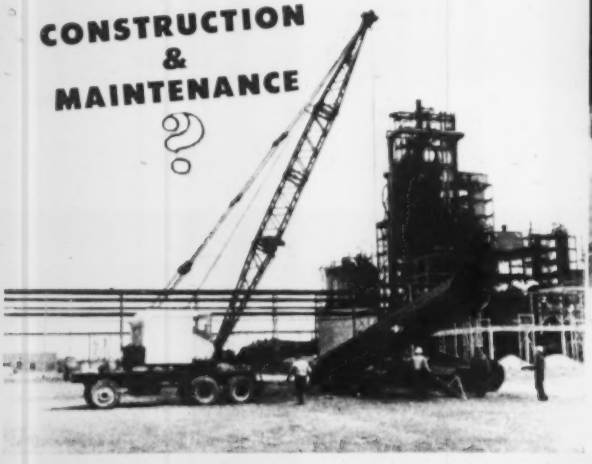


THEW LORAIN®

CRANES FOR INDUSTRY

Department, Publication Section, 1480 Oakman Blvd., Detroit 32.

Exposition to Show Materials

A three-day conference to discuss the range of basic materials available to manufacturers will be held at Hotel Roosevelt, New York, June 16-18. Clapp & Poliak Inc., exposition managers, report the conference will supplement the exposition of basic materials for industry, scheduled June 15-19 at the Grand Central Palace in New York.

The combined events are billed as a clearing house of information for the entire field of materials for hard goods manufacturing. D. G. Mitchell, president of Sylvania Electric Products Inc., heads a board of 20 executives sponsoring the affair.

Strip Descaled by Blasting

Descaling hot-rolled steel strip at high speeds and low cost by airless blasting is the subject of a bulletin published by American Wheelabrator & Equipment Corp., Mishawaka, Ind. The publication describes and illustrates the blasting equipment and its operation at two steel mils.

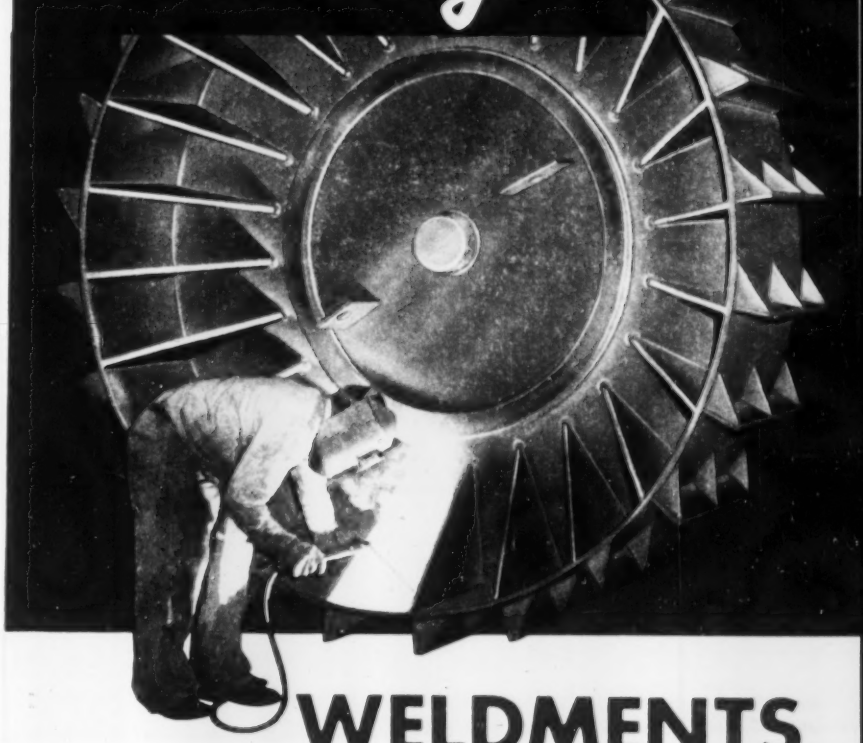
Elimination of scale breaking, descaling at production line speeds up to 400 fpm, less use of pickling acid, reduced manpower and space requirements and considerable metal saving are advantages attributed to the process. Copies of the 4-page bulletin are available free from the company.

ASTE Sessions Complete

Increased productivity and cost reduction will be emphasized in the technical sessions at the 21st annual meeting, American Society of Tool Engineers, in Detroit March 17 to 20.

The 21-paper technical program, one of the most comprehensive in the society's history, covers several new fields in which tool engineers are now actively engaged. According to L. B. Bellamy, society president, these broadened interests by tool engineers have come about as a direct result of the increased productivity and lower cost that can be achieved by injecting pro-

use castings?



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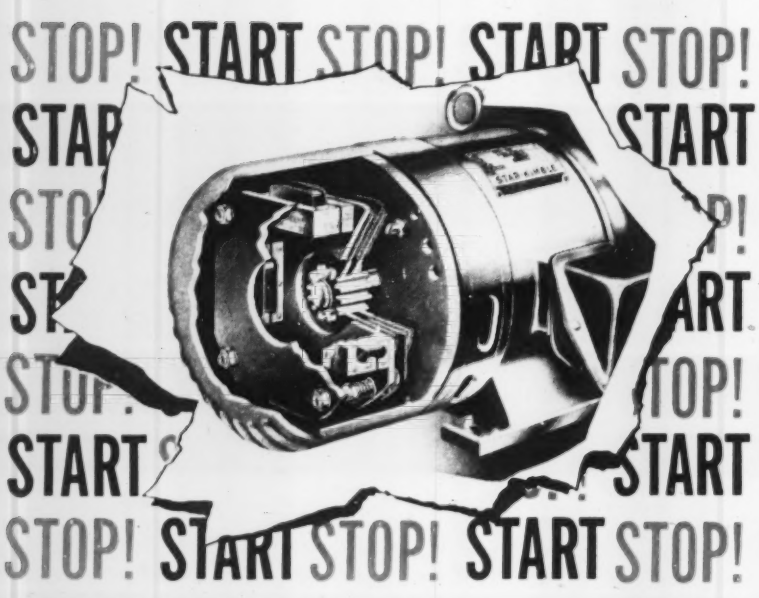

You get them all when you specify Star-Kimble Brakemotors

NOTE THE EXTRA-LARGE BRAKELINING AREA—discs machined on both sides to give full, positive contact—that brings a Star-Kimble Brakemotor *and its connected load* to the same sure fraction-of-a-second stop through *millions of operations.*

NOTE THE SMALL AIR GAP between electromagnets and brake armature disc. It assures quick brake release—allows the load to start freely when the motor is energized.

COMPARE THE REVERSING CYCLE of a Star-Kimble Brakemotor and a motor reversed by conventional plugging. Typical figures on maximum starts per minute for a 5 hp motor: with plug stops, *three;* with the Star-Kimble way, *ten!*

REMEMBER a Star-Kimble Brakemotor is a compact, integral unit, with a short sturdy shaft that's common to motor and brake. Saves space—saves bearing and brakelining wear. One manufacturer—one responsibility.

For information on design and service features, write for Bulletin B-501-A

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duction know-how into fields related to tool engineering. Among these fields are product design, metallurgy and cost control.

Dual-Fuel Six Announced

A high-powered engine for trucks and industrial uses, model 1091, has been put into production by Hall-Scott Motor Division, ACF-Brill Motors Co., Philadelphia. The six-cylinder engine can be supplied to run on either gasoline or butane. It can be converted from one fuel to the other with only slight modifications.

Cylinders have a bore of 5¾ inches, with a 7-inch stroke. Total displacement is 1091 cu in. Dry weight of the bare engine is 2150 pounds; accessories weigh 150 pounds. The engine's overall length is 62¾ inches; height, 47⅞ inches; and width, 30½ inches.

The cylinders are cast enbloc, made of chrome, nickel, and molybdenum cast iron. The model has seven main bearings and is water-cooled. Powered with gasoline it is rated at 285 brake horsepower at 2200 rpm, and with butane, it develops 318 bhp at 2200 rpm.

Lubrication Seminar Scheduled

Practical seminar on industrial lubrication engineering is being sponsored by the Philadelphia section, American Society of Lubrication Engineers, beginning on Feb. 10.

Course will continue through four more consecutive Tuesdays ending Mar. 10. All sessions are scheduled for Philadelphia's Bellevue-Stratford hotel.

Explanation and instruction will cover such topics as lubricant dispensing equipment, planning and installing complete lubrication maintenance programs and theory and application of drawing compounds and cutting oils.

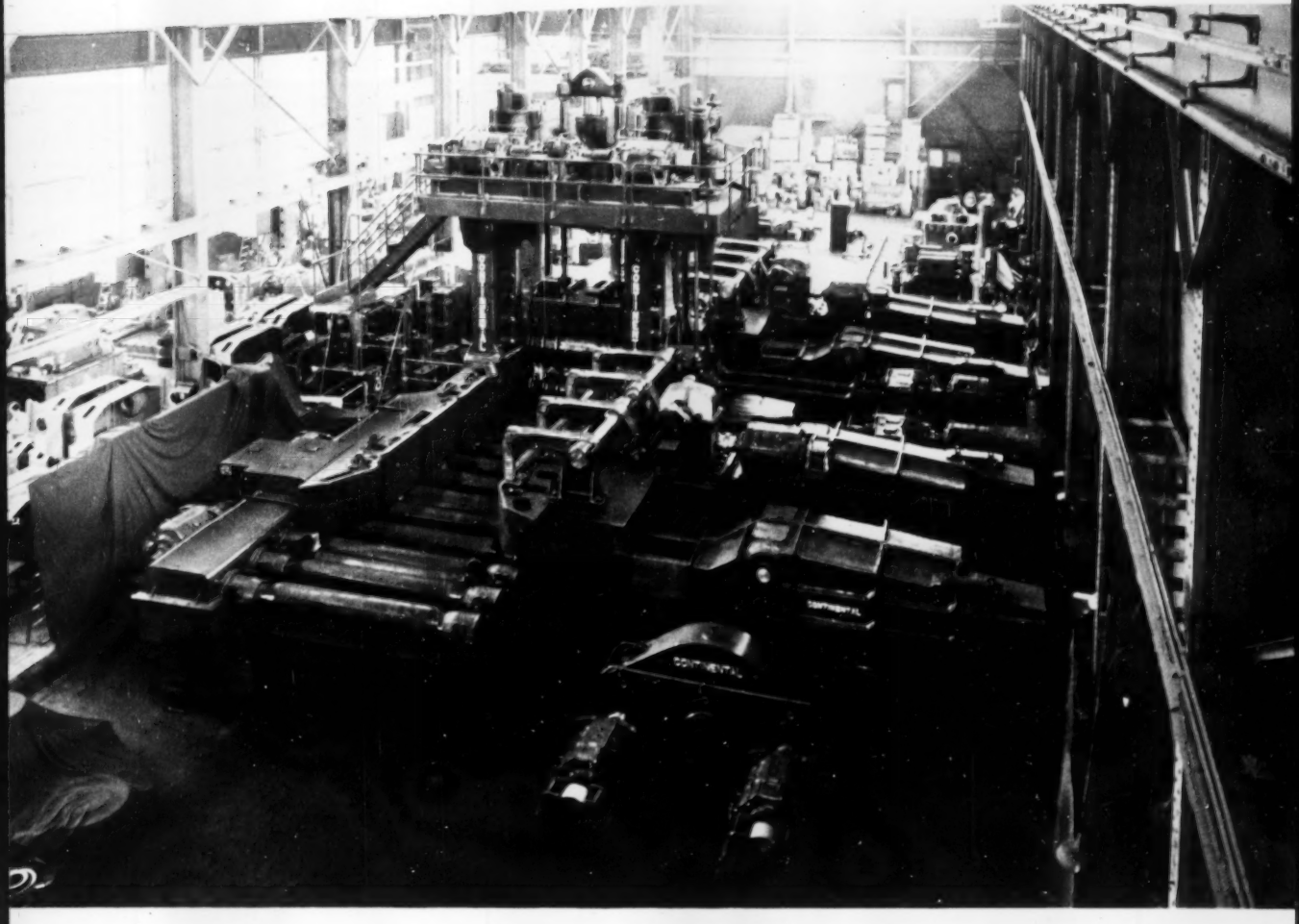
Oblique Stacking Merits Told

How oblique stacking cuts down aisle requirements, provides more storage capacity and eases stock selection and inventory is shown in a 6-page materials handling study released by Baker-Raulang Co., Cleveland.

Example formulae for correct angle selection in an oblique stack-

CONTINENTAL

SHOP ASSEMBLY OF A 40" BLOOMING MILL WITH TABLES AND MANIPULATOR AT WHEELING PLANT



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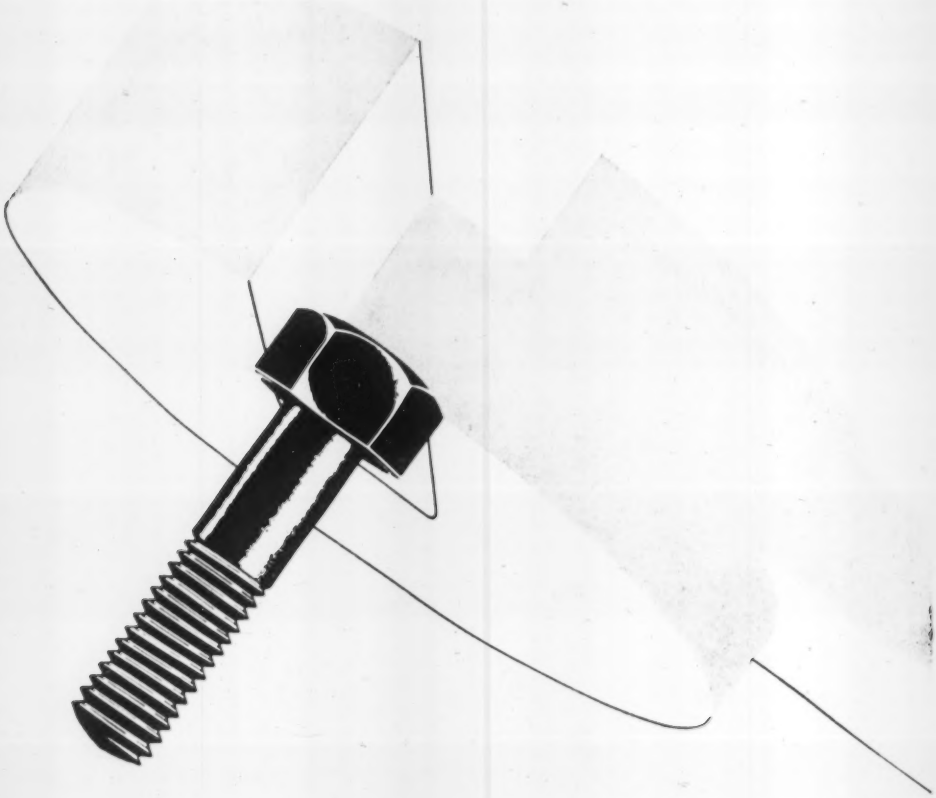
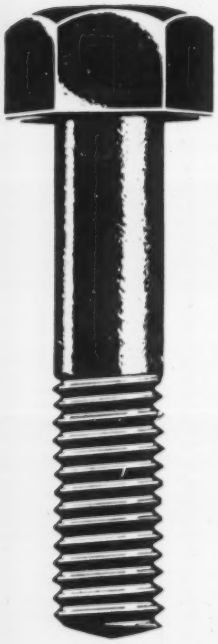


STRONG ON TORQUE



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Shooting the Sample

Technician at Carboloy Department, General Electric Co., Detroit, examines metallic elements in powder form used in cemented tungsten carbide. A picture of the spectrum produced from the sample in the spectrograph permits rapid analyses — possible sometimes in only a matter of minutes

ing setup are included in the report. Charts show how variables of aisle layout, column locations, pallet sizes and fork truck capacities affect the planning of an oblique stacking system. Copies are available free from company headquarters, 1230 W. 80th St., Cleveland 2.

Sling Chain Selection Eased

Engineers of the Chain Division, McKay Co., Pittsburgh, recently completed a chart designed to make sling chain selection easier, simpler and safer.

The chart identifies various types of sling chains and different attachments that may be used on single, double, triple and multiple slings for lifting any given load. It gives specifications, length and width of links, number of links per foot, proof-test and other pertinent data chain users and buyers require.

Corrosion Lectures Scheduled

A series of ten lectures for the benefit of engineers in industries concerned with corrosion problems will be given at Stevens Institute of Technology, Hoboken, N. J., starting Feb. 12.

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these operations
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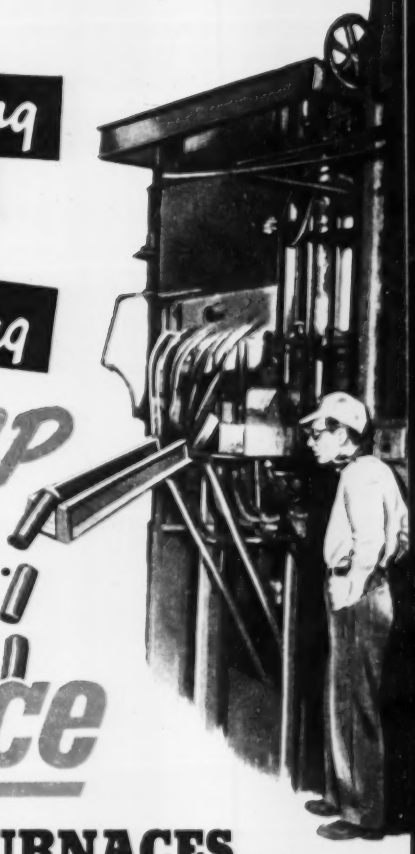

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High speed heating offers you unlimited possibilities for *BIG* production at tremendous savings. 'Surface' high speed furnaces are the tools with which to do it. Let's take a typical installation in the busy automotive industry. A prominent auto and truck maker installed *one* automatic line of Surface High Speed Furnaces. *It replaced three hand operated lines* . . . and INCREASED PRODUCTION IN THE BARGAIN. In most places where Surface High Speed Furnaces have been installed, unprecedented RESULTS have been accomplished. Floor space is often saved while production is increased.

An advanced combustion system, based on the use of high thermal heads automatically maintained and controlled, offers many advantages — increased production . . . better metal surface control . . . fewer rejects . . . improved die life . . . *less metal loss* and thus, decided overall savings. Let us help you make your present production heating methods more profitable. No obligation, of course.

FORGINGS You can heat them faster automatically with a Surface High Speed Furnace with such outstanding results as: savings in floor space . . . savings in metal . . . lengthened die-life . . . cleaner forged parts . . . lower fuel cost. Heat up to 2600 F.

STRESS RELIEVING IN 7 SECONDS Steel tubing has been stress relieved at as high as 21,000 lbs. per hour. This is one of the many money-saving opportunities possible with Surface High Speed Furnaces.

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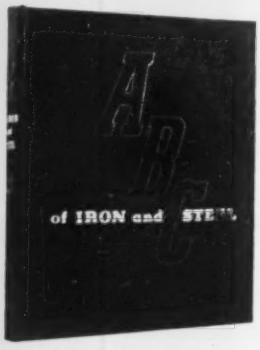
Surface INDUSTRIAL FURNACES AND BURNERS
Kathabar HUMIDITY CONDITIONING SYSTEMS
Janitrol AUTOMATIC SPACE HEATING EQUIPMENT

This book was written by men you know and respect as "tops" in steelmaking . . .



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tion of Corrosion Engineers, the lectures, under the general heading "Prevention of Corrosion," will be given by authorities in the field on Thursday nights at 7:15. Introductory session on February 5 featured a movie on corrosion made by International Nickel Co.

Hunt on for Germanium

SEARCH of ash pits and flue dust for additional sources of the costly metal germanium has been launched by Department of the Interior's Bureau of Mines among large industrial coal consumers. The metal is needed for use in radar and other Armed Forces electronic equipment.

According to Secretary of the Interior Douglas McKay, the rare element is now produced in the U. S. in small amounts as a by-product of zinc refining. It also appears in minute quantities in many domestic coals, but is uneconomical for direct recovery. Instead, the best method is to extract it from the ash after the coal is burned. The germanium research project is being conducted in the Pittsburgh region in co-operation with Signal Corps engineering laboratories at Ft. Monmouth, N. J.

The metal sells now at about $350 a pound or nearly 65 per cent more than the price of gold. All germanium used in the U. S. today is recovered from sludges during electrolytic tin production. Chief supplier is the Henryetta, Okla., plant of Eagle-Picher Co., but the bureau says several other firms are getting into production.

Only about 1 pound of germanium can be recovered from every $2\frac{1}{2}$ million pounds of zinc ore. Annual output is about 6000 pounds, but the projected need for the electronics industry goes as high as 40,000 pounds by 1956. Likewise, germanium content of domestic coals offers no bonanza. Average, says the bureau, is about 0.001 per cent. This indicates recovery operations will be limited to the larger users.

The bureau says it will be unable to make assays on samples submitted by mine owners and others, but reports Pennsylvania Coal & Coke Corp., New York, has arranged to handle analyses.

Hot, but still Handled

High degree of insulating ability is indicated by this heat test on Alfrax BI brick made by Carborundum Co., Niagara Falls, N. Y. Here the operator holds the brick in his bare hand even though it has been heated to 2000 F at the other end. The heat-resistant refractory consists of bonded hollow aluminum oxide spheres

Disk Brake Industry Use Seen

Applications and advantages of airplane-type disk brakes for industrial uses are described in an illustrated booklet published by Goodyear Tire & Rubber Co.'s industrial brake department.

Ranging in diameter from 8 to 72 inches, the brakes can be operated hydraulically, mechanically or pneumatically, or can be spring-set, solenoid-released. Copies are available from industrial brake department, Aviation Products Division, Goodyear Tire & Rubber Co. Inc., Akron 16.

ASTE Revises Fuel Talks

"Engine Test Methods for Rating Fuels" has been revised in a second edition by American Society for Testing Materials. This edition incorporates all changes in the five standard methods for rating motor, aviation and diesel fuels adopted since the first publication in 1948.

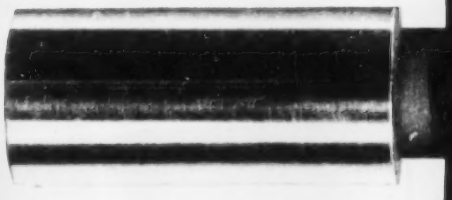
Six revised supplements contain information on best practices now in use for laboratory facilities, installation of engine test units, provisions for reference materials and

how SURFACE DEFECTS impair bearing operation

No matter how smooth a ground surface may appear, examination will reveal imperfections in the form of grinder scratches and ridges, feed spirals, chatter marks and partially loosened metal splinters. Upon contact, these minute peaks and ripples interlock with the mating surface of the bearing, tending to rupture the protective oil film. Fragmented metal is torn from surfaces to mix with lubricant and cause abrasive wear, increasing clearance dimensions and shortening life. Photo at right shows an example of a scratched and galled surface which stopped rotation by "plowing" metal.

how SUPERFINISH insures bearing life

Superfinish removes all surface defects such as grit scratches, feed spirals and the soft "smear metal" caused by grinding heat, and having removed the faulty layer—gets down to metal of the desired structure and hardness. At the same time, it produces a more nearly perfect geometrical form which supports a more efficient oil film for lubrication. There are no projecting defects to churn the oil film or cause metallic contact.



Load carrying capacity is substantially increased by Superfinishing. And bearing life is greatly prolonged.

you should know the facts about SUPERFINISHING!

It may surprise you to know what a quick and inexpensive process Superfinishing really is. It can greatly reduce the cost of grinding and, in many cases, eliminate such expensive operations as hand lapping and polishing.

If you have not yet read the booklet "Wear and Surface Finish," we will be glad to send you a copy of this authoritative text book with our compliments. Please request it on your company letterhead.

GISHOLT MACHINE COMPANY
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THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

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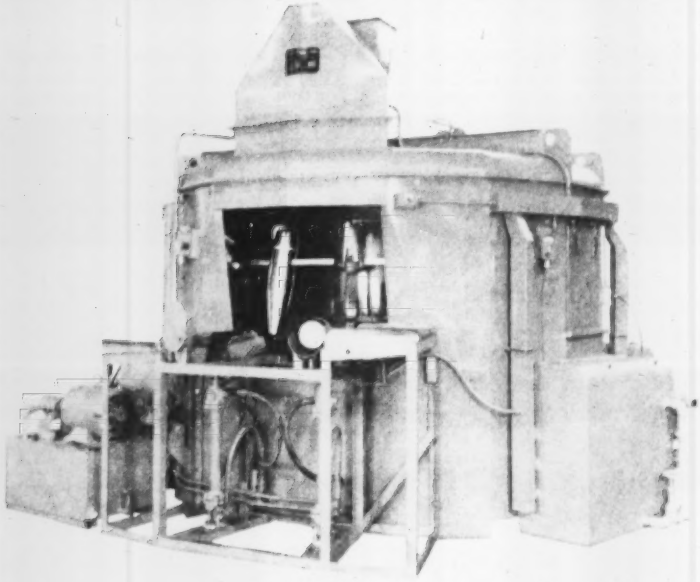
by the Turn of a Wheel



5 Stage Rotary Cleaning and Phosphatizing Unit

For: Shells, Shell Casings, Rockets.
Featuring: Automatic Hydraulic Loading and Unloading Device.

Another example of where "chance" has been eliminated. PD Engineers can specify and build Industrial Washers to meet your specific requirements. This Peters-Dalton Industrial Washing Machine has been especially designed to meet a particular customer's needs. The Washer, being rotary in action, occupies less floor space than a conventional straight line machine. In addition to the unit's cleaning action, it etches and gives bonding surfaces preparatory to painting.

Cure-all methods don't work. PD Engineers, with their extensive background of experience and knowledge, are available to discuss your problems for between-operation cleaning or paint preparation. If you would like us to tell you more—write, wire or phone.

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electrical, water and air services, and operation and maintenance. All material is extensively indexed. Copies of the 360-page manual are available from the society, 1916 Race St., Philadelphia, for $8.

Press Pierces Bearing Cages

Equipped with a special fixture, a power press has been built to pierce the cage of needle bearings. Operating at 100 strokes per minute the machine pierces 19 rectangular shaped holes, 7/64-inch wide by $\frac{5}{8}$-inch long, in bronze tubing 0.025-inch thick.

As designed by V & O Press Co., division of Emhart Mfg. Co., Hudson, N. Y., the press punches in a horizontal direction. The tubing blank is placed over a die where it is automatically pierced and indexed for the successive slots. When the required 19 piercings are completed the machine stops automatically. An 18-ton V & O press was adapted for the application.

Aluminum Duct Data Revealed

Correction factors for use with the "Heating, Ventilating and Air Conditioning Guide" friction charts when using aluminum duct material were presented in a paper at the annual meeting of American Society of Heating and Ventilating Engineers, Chicago, by F. W. Hutchinson, professor of mechanical engineering, University of California.

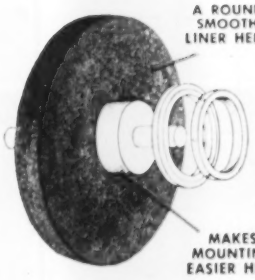
Results of this study indicate that aluminum ducts of standard construction present less frictional resistance than does the conventional galvanized sheet metal ducting. The advantage of aluminum is said to increase with velocity; and at high velocities, the size of an aluminum duct (for a fixed volume of air handled) would be approximately 10 per cent less than the required size of a galvanized iron duct.

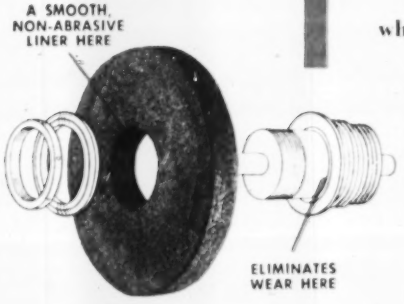
Power Crane Papers Published

Series of eight articles discussing the use and application of power cranes and shovels has been compiled by Koehring Co., Milwaukee, and made available for distribution. The articles originally were written by E. O. Martinson.

GREATER PRODUCTION...

Here is MID-WEST'S New Automatic Snagging Grinder (patented) a great time saver on all types of snagging operations. Let us tell you how it can cut costs on your grinding jobs.





. . . that's what you get when you use MID-WEST'S Fiber-Cushioned Snagging Wheels.

. . . and here are the reasons why they are better "on the job" wheels.

- **easier to mount.**
- **easier on your operator.**
- **easier on your spindle and bearings.**
- **easier on your work piece.**

Not only will Mid-West Fiber-Cushioned resinoid snagging wheels minimize the troubles so characteristic of snagging operations, but they're easier to mount, they're stronger, and they last longer.

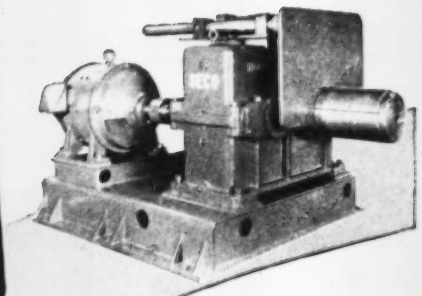
The fiber-cushioned centers plus Mid-West's special resinoid bond, an extremely cool cutting bond, assures a highly satisfactory wheel life and increased production.

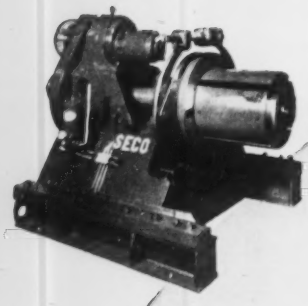
For complete information on these Fiber-Cushioned snagging wheels, write, wire or phone today.

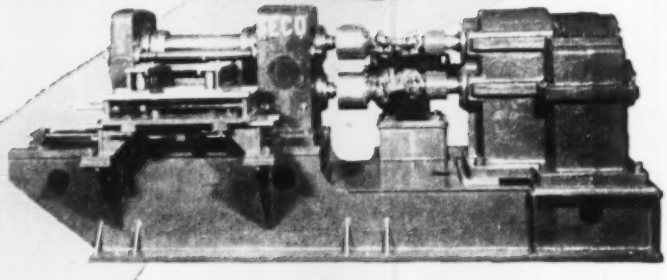
MID-WEST ABRASIVES

Executive Offices: 510 South Washington Street, Owosso, Michigan
Plants in Owosso, Michigan and Rochester, Pennsylvania

YOU CAN SLIT 1/4" STEEL LIKE PAPER!





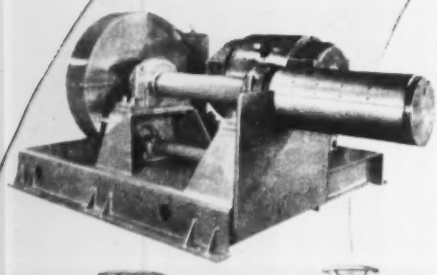


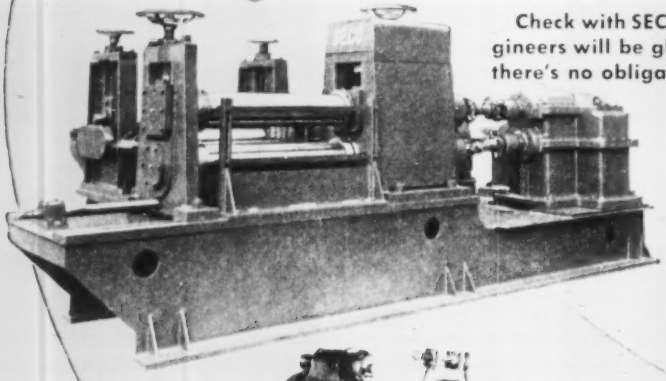
SECO SLITTING LINES HANDLE TOUGH JOBS — GIVE FAST, PROFITABLE PRODUCTION ON HEAVY STOCK

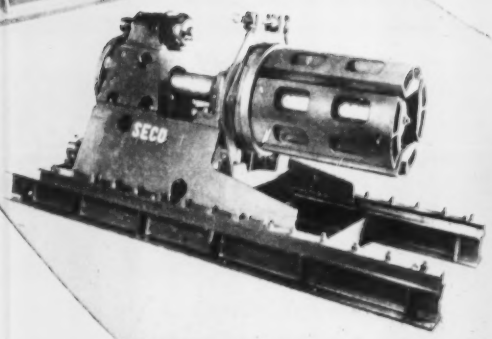
It takes plenty of rugged strength to slit 1/4" steel. But powerful, efficient SECO Slitting Lines can handle this tough job easily and quickly. Production is fast and profitable, with a minimum of down time.

Exceptional quality and accuracy are built into every piece of SECO equipment, large or small. The latest design and engineering features are included — to give you highest efficiency and years of trouble-free service.

Check with SECO today on your slitting requirements. Our engineers will be glad to talk over your problems with you — and there's no obligation on your part. Write for full information.







STEEL EQUIPMENT CO.

Designers and Builders of Steel Mill Equipment

P.O. BOX 737, WARRENSVILLE STATION
CLEVELAND 22, OHIO

• Shown above are two heavy-duty SECO Slitting Lines capable of slitting steel up to 1/4" thick. The payoff reel, slitter and recoiler in the top three photos handle up to 20" width stock. The bottom three photos show a line of simplified design for slitting strip up to 42" wide. Both lines will handle up to 20,000 pound coils.

SECO

Koehring's vice president in charge of engineering.

As indicated by the title, the 32-page booklet contains a detailed discussion on the basic principles of power shovel and crane operation. Aided by photographs, drawings, graphs and tables, the capabilities of various excavator and crane attachments are outlined along with prescribed requirements for most efficient operation of these machines. Details involved in making a proper selection of this equipment for ordinary operating situations also are discussed in detail.

Roll Speeds Parts Marking

Elimination of a separate parts marking setup which results in lower unit production cost is accomplished on a six-spindle Greenlee automatic screw machine by using an automatic roll marker in the fourth position to mark parts during the machine cycle.

On one application, patent number and trade mark are imprinted in 3/32-inch characters on aircraft hydraulic hose coupling nipples by the marker. It advances, marks the part, withdraws and then resets ready for the next part.

At the last count, over 270,000 nipples had been produced from standard screw stock without noticeable wear of the roll marker die, and the machine was still running. The die, manufactured by New Method Steel Stamps Inc., Detroit, is an NM-212A stock roll cut to customer's specifications.

Truck Makers Talk Specs

Cost reduction programs for manufacturing operations can't be controlled completely by one department; they must cover and be applied by everyone from product designer, through purchasing agent, to the line foreman. So says J. T. Foerth, comptroller, Bassick Co., Bridgeport, Conn., in recommending ways to "Wring the Water Out of Costs' if a slump comes.

Mr. Foerth addressed the winter meeting of Caster & Floor Truck Manufacturers Association in New York. He says self-questioning (. . . "if you were foreman, what is the first change in method you'd make?") can originate embryo

LOW COST
IRIDITE®
FINISHES
for zinc, cadmium, aluminum and cuprous metals
provide corrosion resistance
paint base
choice of appearance
And they are easy to apply! Just a simple chemical dip for only a few seconds produces the coating
LOW MATERIAL AND SHIPPING COSTS
combine to make Iridite the most economical chromate finish you can buy. Many Iridite chemicals are packed in powder form, thus can be shipped to you in steel pails at freight savings of up to 75%! Pails take less storage space, are easier to handle, eliminate carboys, need not be returned.
WHY NOT TEST IRIDITE ON YOUR PRODUCTS? Write for literature and send samples for free test processing. See "Plating Supplies" in your classified telephone directory or write direct.
ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD

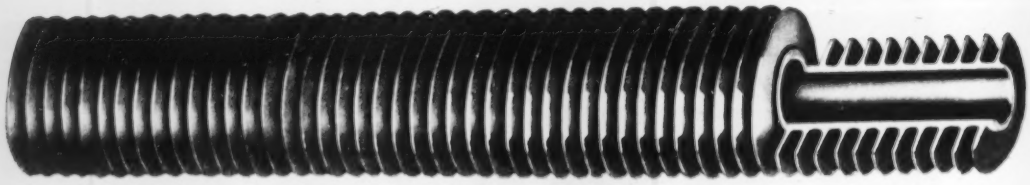
LOOK!

THE FINS OF WOLVERINE TRUFIN* HAVE BEEN SQUEEZED

right out of the tube wall

They are the tube itself—the fins and the tube are integral.

Thus they can withstand vibration and sudden temperature changes—assuring full efficiency at all times.



Trufin is available in (1) a variety of alloys, (2) in fin spacings 5, 7, 9, 11, 16 and 19 fins to an inch and (3) in a range of inside diameters from 5/16" to 1".

Also available in bi-metal with an integral fin construction and different metal lining.

Ask for our new Catalog 201 that will give you more detailed information. If you have an immediate problem dealing with heat exchangers we invite you to call our Customer Engineering Service which can offer much helpful information.

*REG. U. S. PAT. OFF.

WOLVERINE TUBE DIVISION

of Calumet & Hecla, Inc.

Manufacturers of tubing exclusively

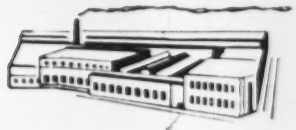
1439 Central Ave. Detroit 9, Mich.

Wolverine Trufin and the Wolverine Spun End Process available in Canada through the Unifin Tube Co., London, Ontario.

PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA
Sales Offices in Principal Cities

Export Department, 13 E. 40th St., New York 16, N.Y.

You'll like this new tube



WOLVERINE ELECTRIC WELDED STEEL TUBE

Produced by tube specialists, this new electric welded steel tube possesses everything you demand in this type of tube.

Of special interest to you is the technical service we can offer you through our Customer Engineering Service which will give you the benefit of an extensive background of tube manufacture and tube application. Availing yourself of this specialized service can prove very helpful in making your equipment—such as condensers, heat exchangers or boilers—operate at highest efficiency.

Contact the nearest Wolverine representative (see Yellow Pages of your phone book); he'll be glad to give you more details.

ALLOYS		SIZES
SAE 1010	SAE 1015	¼" to 3" inclusive
SAE 1020	SAE 1025	
SAE 1030		

Other Wolverine Products

CAPILATOR*
—the capillary tube for restriction purposes
COMMERCIAL TUBE
AUTOMOTIVE TUBE
CONDENSER TUBE
COPPER-WATER TUBE (K-L-M)
ELECTRIC WELDED STEEL TUBE
FABRICATED TUBULAR PARTS
WOLVERINE TRUFIN*
—the integral finned tube
REFRIGERATION AND AIR CONDITIONING TUBE (Plain or Tin Plated)
S.P.S. PIPE
SPUN-END TUBE†

*Reg. U.S. Pat. Off.
†A Patented Process RE 22465

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Manufacturers of Tubing Exclusively
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top-drawer

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Assembly line fastener supply — right in your top desk drawer. That's what Camcar Stock List Service gives you twice monthly.

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CAMCAR SCREW & MFG. CORP.
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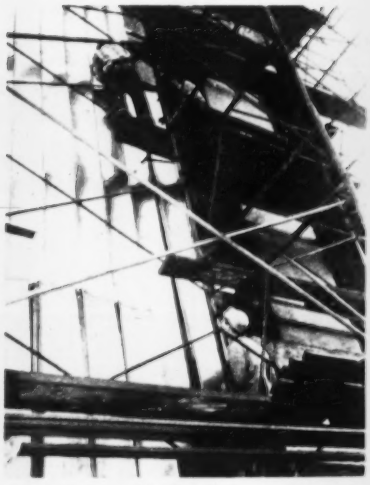
"PRODUCTION-DESIGNED FOR YOUR ASSEMBLY LINE"



Die-Stamped Facade

Stainless steel panels are installed vertically over old masonry walls by Heppenstall Co., Pittsburgh, to make over two buildings into new office quarters. Panels are die stamped in a fluted design to prevent wrinkles and waves. An air space between the panels and original walls provides constant inter-wall air circulation

ideas that in turn can lead to major cost reductions.

Committees at the session reported programs underway for standardization of specifications, sizes and quality. Groups at work on the project cover two-wheel, platform, trailer and wagon-type trucks, dead and semi-live skids and lift jacks, industrial wheels and casters.

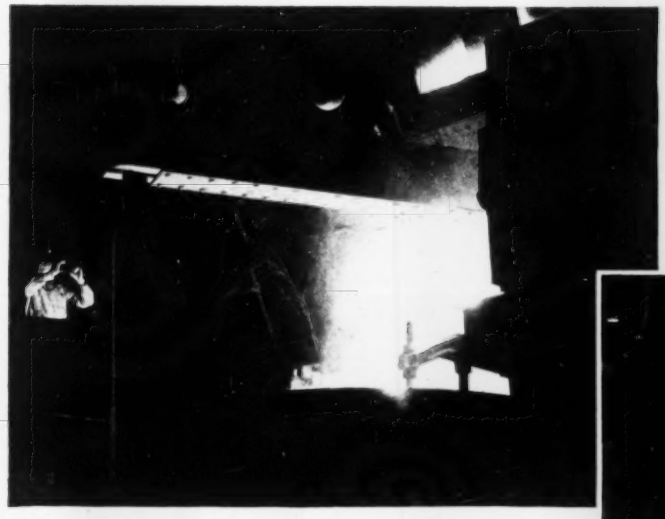
Exhaust Fan Is Odd-Shaped

A towering 20-ton exhaust fan, shaped like a huge malted milk container, has been installed by The International Nickel Co. of Canada Ltd., to ventilate the underground workings of the new caving project at its Creighton Mine in the Sudbury District of Ontario.

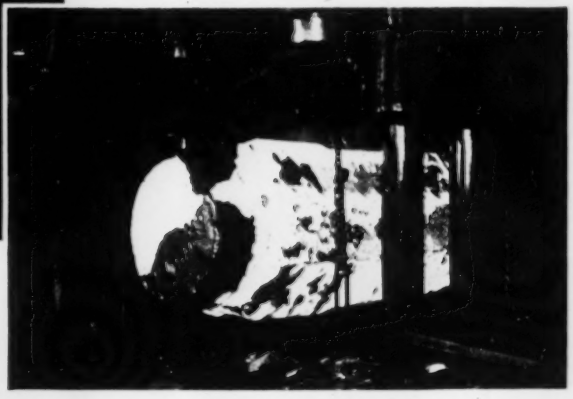
The giant vertical fan, driven by a 350-horsepower motor weighing five tons, ventilates the workings by a flow of fresh air at the rate of 300,000 cubic feet per minute. The fan draws the air down from the surface, directly through the caved or broken ore, circulates it through the underground workings and carries it back to the surface through a main return shaft.

Fan stands 42 feet above its con-

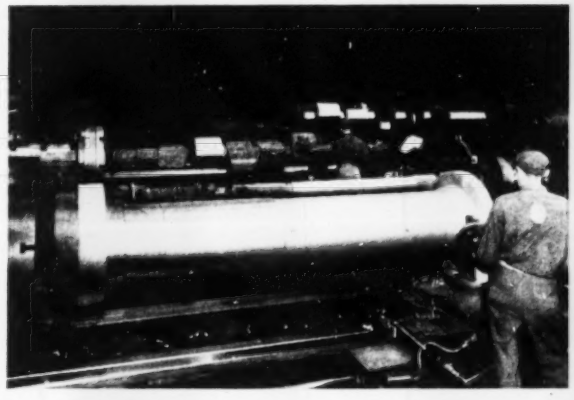
HERE'S THE STORY OF YOUR FORGINGS AT NATIONAL FORGE AND ORDNANCE CO.



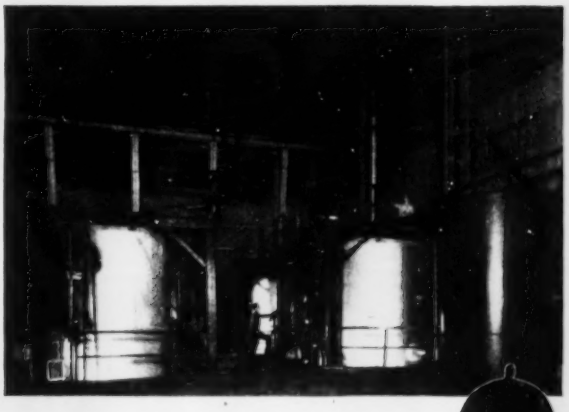
1. Basic Electric Steel is made for all forgings.



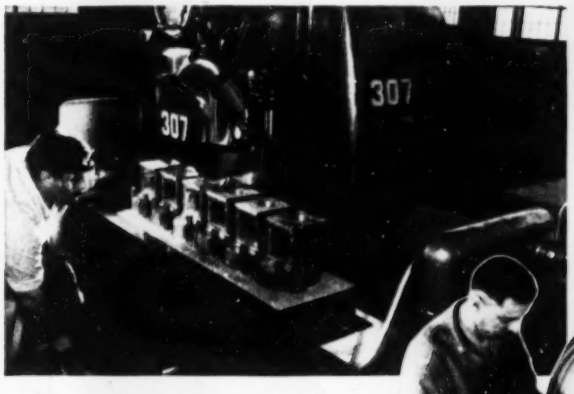
2. Forgings are made from Ingots of proper size for the best final result.



3. Forgings are rough machined before heat treatment to insure greatest uniformity.



4. The heat treating equipment is adapted to the job to be done.



5. National Forge can make your forgings large or small rough or finished.

6. Precision is a by-word at National Forge.

NATIONAL FORGE AND ORDNANCE CO., IRVINE, WARREN CO., PENNA.

make light of your heavy loads

handle them
"THRU-THE-AIR"

P&H HEVI-LIFT
HARNISCHFEGER CORP. MILWAUKEE, WIS.

Capacities up to 15 Tons.

How much does materials handling add to your production costs? Along assembly lines? Around machine tools? On loading platforms? In and out of storage? Handling materials is the largest single cost item in most plants. Start licking it now!

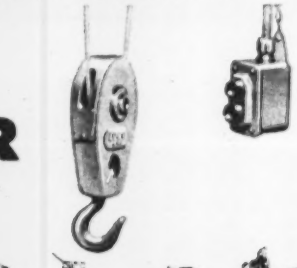
Thousands of plants have found the answer to efficient movement of materials with this quick, effortless, low cost way — "thru-the-air" with P&H Hevi-Lift Hoists.

You merely press buttons to whisk loads from one station to another — no strain on skilled hands, no floor congestion, no costly delays. With P&H's full magnetic push-button control, you can also have variable speed where needed.

P&H Hoist Engineers have helped solve hundreds of problems like yours. They can show you how to save money — in the places where most money *can* be saved.

CALL YOUR P&H HOIST DEALER
Or write us for Bulletin H-20.

P&H HOIST DIVISION
HARNISCHFEGER
CORPORATION
MILWAUKEE 46, WISCONSIN



the P&H *Line*

crete base, and the diameter at the inlet is 15 feet. The 124-inch impeller has 12 stainless steel blades which are adjustable in pitch through 25 degrees to accommodate the load as the mining operation moves farther from the main return air shaft.

Control Devices Are Keys

Brown Instrument president tells planners to build systems into plants from beginning

AMERICAN industry, which has been investing between 7 and 8 per cent of its capital expenditures on recorders and controllers, was pictured as "ready for the next big step"—building the maximum of automatic controls into each new factory "from the beginning."

Henry F. Dever, president of Brown Instruments Division of Minneapolis-Honeywell Regulator Co., Philadelphia, recently told some 250 industrial engineers attending the eighth annual instrumentation conference held at Texas A&M College that this could mean that U. S. industry's investment in instruments would rise to between 10 and 15 per cent of its capital expenditures for machinery and equipment. And, he added, this figure would be applied to increasingly larger expenditures as the economy grows.

Depart from Tradition — "Management that has become conditioned to traditional ratios of spending," Dever said, "must now recognize that this advance planning, or 'systems engineering,' justifies its cost. In almost any mass production even minor improvements in efficiency are measurable in anywhere from thousands to millions of dollars yearly."

In a keynote address Dever branded the Utopian concept of fully robotized factories as "still in the realm of science fiction." Until the responsibility for this advance planning is settled and until technological education is broadened, Dever declared, widespread fully automatic manufacture will not be an industrial reality. Furthermore, he added, unless the economics are right this technology will be of little use. He reminded the group that "there will always be some areas where full automation will never make engineering or economic sense."

Must Develop—Stating that it is imperative that American industry develop the full potential of automatic control—"currently we are only about 10 to 20 per cent along the way"—Dever pointed out that America's civilian work force will just not be able to cope with tomorrow's needs unless it has the widespread use of mechanical aids.

From 1940 to 1950, he explained, the nation's population climbed some 20 million and is likely to grow that much again in the next 10 years. "By the time these youngsters grow up our present labor force, big as it is—and it's now only about one million under the last war's peak — will be hard pressed to meet the new demands for cars, homes, clothing, food, or any of the things people want."

"Automatic controls and industrial instruments can be utilized to ease this productive burden," he said, "the better if they are engineered into each new production facility at the outset rather than merely 'applied' after a process has been set up."

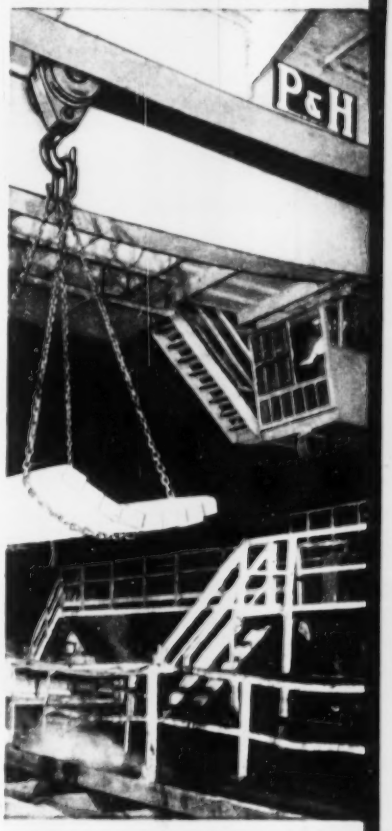
Underwriters OK Electrifloors

Electrified steel panel subfloor manufactured by the Detroit Steel Products Co. and the National Electric Products Corp., has received the listing and approval of the Underwriters' Laboratories, Inc., according to a joint announcement by the two companies.

Of cellular, light-gauge steel construction, the electrified floor was designed after months of tests administered under the direction of the American Iron and Steel Institute. A header duct system with conductors running through the cells of the floor is National Electric Product's contribution to the electrifloor. The system permits the installation of electrical outlets in each square foot of space.

Underwriters' representatives cited the enclosed cells of the floor which assure smooth, clean raceways for electrification. Maintenance costs caused by insulation wear, dampness and mechanical injury are eliminated by a butt closure method of sealing the installed floor.

P&H OVERHEAD CRANES



Electrically Better, Too!

Structural strength? You can take that for granted. But look closely to the electrical equipment. That's the important factor in overhead crane service. That's why P&H builds its own electrical equipment — designed exclusively for crane operation, not adapted for it. Experience is the reason for P&H leadership — experience in building and servicing more than 18,000 electric cranes — far more than any other. You make no mistake when you let P&H build the entire crane — and take the complete responsibility for service.

Write for Bulletin C-6

P&H OVERHEAD CRANE DIVISION

P&H MAGNETORQUE® AC Crane Control provides the finest known speed load characteristics.

HARNISCHFEGER CORPORATION
MILWAUKEE 46, WISCONSIN

FOLLANSBEE
COLD ROLLED STRIP
PRECISION ROLLED TO YOUR SPECIFICATIONS

Follansbee offers the special attention and services which only the flexibility of a compact organization can provide. If you need Cold Rolled Strip Steel, Follansbee merits your consideration as a source for your supplies.

Follansbee brings to the rolling of this staple product its many years of experience as a maker of high quality steel specialties. This means that you can rely on Follansbee to furnish you with Strip that meets your most exacting requirements in Temper, Gauge, and Width.

On your next order for Cold Rolled Strip—or other steels—it will pay you to check with Follansbee.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

POLISHED BLUE SHEETS AND COILS SEAMLESS TERNE ROLL ROOFING
COLD ROLLED STRIP

Sales Offices: New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee, *Sales Agents:* Chicago, Indianapolis, Kansas City, Nashville, Los Angeles, San Francisco, Seattle, Toronto and Montreal, Canada. *Mills:* Follansbee, W. Va.

FOLLANSBEE METAL WAREHOUSES

Pittsburgh, Pa. Rochester, N.Y. Fairfield, Conn.

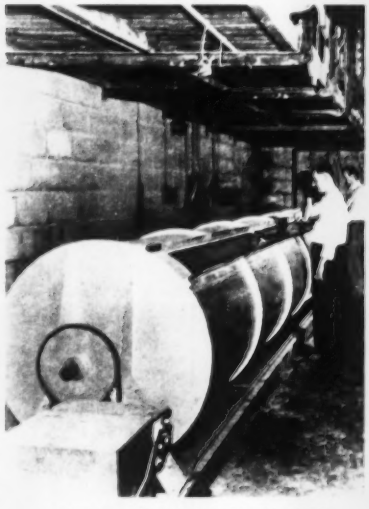
Coating Process Improved

Operations sequence for coating black pipe is refined by new dipping, drying setups

DIPPING machine and drying unit have been designed and built by Barrows Porcelain Enamel Co., Cincinnati, to complete the operations sequence for applying porcelain coatings to long lengths of black steel pipe.

Now in production line operation, the two units prepare pipe for continuous fusion of ceramic coating, accomplished by a special furnace. The new equipment solves several problems in handling prior to the fusing step.

In coating application, the slip or wet enamel is applied after a



COATING BLACK STEEL PIPE
. . . new setup completes sequence

thorough sandblasting inside and out. To gain the required close thickness control, Barrows applies the slip in a dipping operation. This requires facilities for handling 21-foot-long pipe, coating it and draining away excess slip to retain uniformity in application on all surfaces.

Integral Dipping Process—The dipping unit developed to do this job consists of two long troughs to hold enamel slips. One trough has ground coat material, the other contains cover coat. Between the two troughs is a third a shallow unit with fittings at each end to hold pipe lengths to 21 feet. This center trough is pivoted at one end

What do you do when it takes hours... sometimes days... to change v-belts?

1

Put one or several maintenance men on the job

...and pay for repairs while production stands still

2

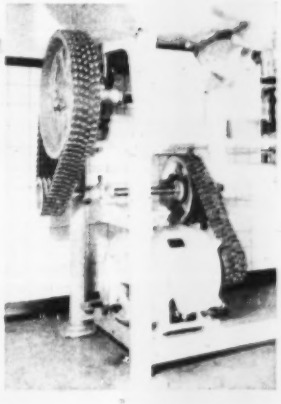
Pay overtime

...and have repair costs eat away your profits

3

Standardize on VEELOS...

...and change belts in up to 1/10th the time
...save labor, save time and save overtime
...keep machines producing for maximum profit



Comparison proves the value of VEELOS...

Minimum Inventory—4 reels of Veelos in the O, A, B and C widths can replace up to 316 different sizes of endless v-belts. If you use only one width of v-belt you can stock just one reel of Veelos.

Quick Installation—link construction makes it unnecessary to remove outboard bearings.

Complete Adjustability—vibrationless, full power delivery is assured because uniform tension on each belt in a matched set can be maintained.

VEELOS DATA BOOK

gives complete details on construction, installation and uses. We'll gladly send you a free copy of this 28-page fact-full book... write today.

MANHEIM MANUFACTURING & BELTING COMPANY
613 Manbel St., Manheim, Pa.

VEELOS
THE LINK
V-BELT

ADJUSTABLE TO ANY LENGTH · ADAPTABLE TO ANY DRIVE

Made in all widths in three types: regular, oil-proof, static conducting. Also in double V in O, A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.

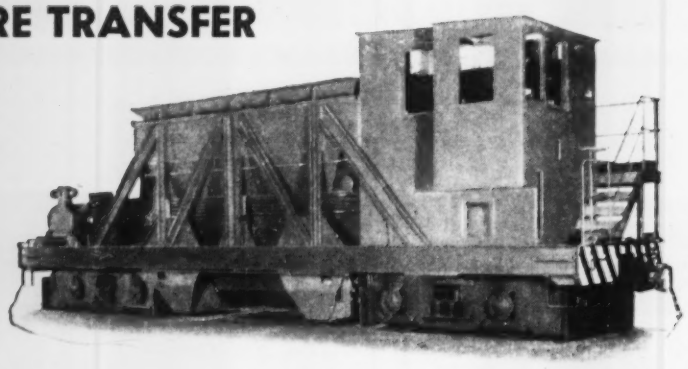
DEPENDABILITY TO SATISFY

RECORD DEMANDS

ATLAS CARS

Atlas Cars for steel plants are known to have that extra work factor which is so important in these days of high production.

50-TON BOTTOM DUMP ORE TRANSFER



This 50-ton ore transfer is a modern air-operated car with a heavy slab truck to protect motors and brakes when plowing through ore piles. For added safety a folding car pusher arm is used and is provided with a safety latch which cannot be lowered unless the switchman holds the latch. The overhung cab allows a clear line of vision for the operator.

Special features include electric hopper heaters, centralized lubricating, roller journal bearings, air brakes and, of course, all necessary safety features.

Custom Builder of Steel Plant Cars

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

and can be swung up to a 45-degree tilting position. At the same time, the pipe can be made to revolve.

When a length of pipe is immersed in one of the troughs, a pump forces liquid material through the inside of the pipe to prevent air pockets. From the dipping trough, pipe is lifted and placed in the draining unit, then tilted and revolved by means of a timing device and held for a specified time before being returned to the horizontal and removed.

Simplified Drying—A pipe dryer, Barrows' second piece of new equipment, simplifies a tough moisture removal task. Previously, air passing through the inside of the pipe became quickly saturated. As it traveled further, it condensed the moisture in the form of solid water and washed the unfired coating off the pipe.

The drying apparatus designed to solve this problem has a series of 15 chambers mounted in rotary fashion, each chamber holding one length of pipe. Steam-heated air, introduced to the chamber, flows around the inside of the pipe. The dryer handles about 4500 lineal feet of pipe per shift.

Pilings Wear Monel Skirts

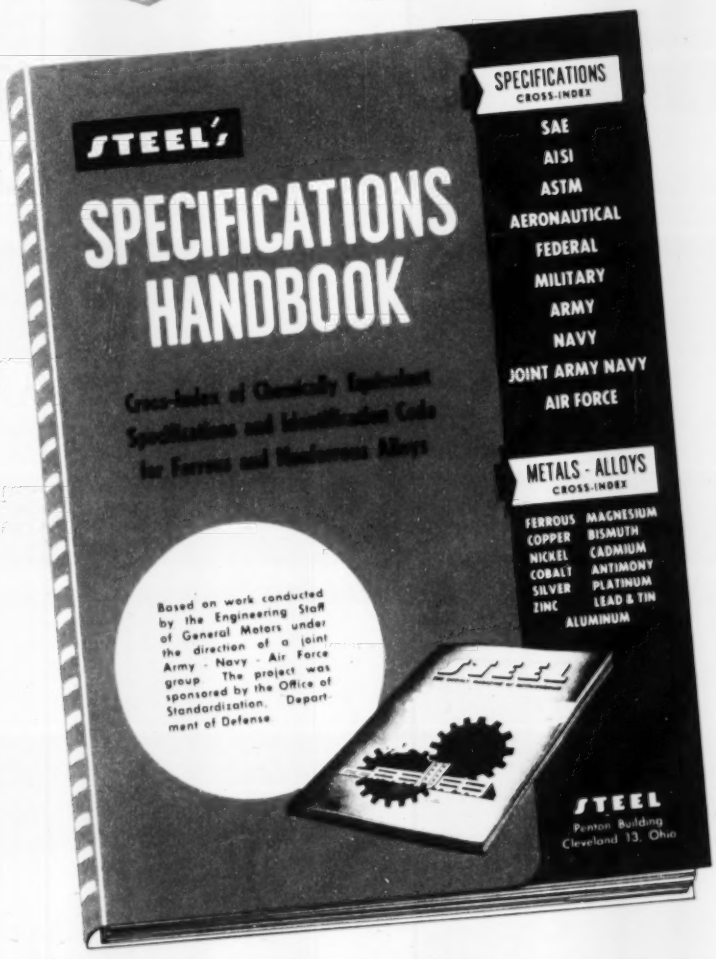
Oil wells which have been sunk at sea to tap the rich deposits of oil lying under the offshore waters of our Southern states can now stand on firmer foundations. By means of a unique "cover-up" technique, the steel pilings which support the drilling platform are made secure against the destructive effect which sea water has on them, according to the Development and Research Division, International Nickel Co. Inc., New York.

Engineers, seeking to protect the steel pilings against the powerfully corrosive action of sea water, tried many materials and methods without success. The final solution proved simple. The section of the piling subject to greatest attack—the entire splash area from the low water line up to and above the maximum splash area—was merely covered up, by welding on to it a sheet of the highly corrosion-resistant material, Monel, an alloy of nickel and copper. Even after long service, the Monel-encased piles remain strong.

380 PAGES

SIZE 6" x 8½"

VISUAL INDEX



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CALENDAR
OF MEETINGS

February 9-11, American Road Builders' Association: Annual meeting, Hotel Statler, Boston. Association address: 1319 F St. NW, Washington 4. Secretary: Gen. Eugene Reybold.

February 13, Eastern States Blast Furnace & Coke Oven Association: Annual winter meeting, Hotel William Penn, Pittsburgh.

February 15-19, Automotive Electric Association: Annual meeting, Edgewater Beach hotel, Chicago. Association address: 802 Michigan Bldg., Detroit 26. Secretary: S. W. Potter.

February 16-19, American Institute of Mining & Metallurgical Engineers: Annual meeting, Hotel Statler, Los Angeles. Institute address: 29 W. 39th St., New York 18. Secretary: E. H. Robie.

February 16-19, Industrial Ventilation Conference: Michigan State College, E. Lansing, Mich. Co-sponsor: Division of Industrial Health, Michigan Dept of Health. Information: K. E. Robinson, Division of Industrial Health, Lansing 4.

February 18-20, Society of the Plastics Industry Inc.: Annual reinforced plastics conference, Shoreham hotel, Washington. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

March 2-6, American Society for Testing Materials: Spring meeting, Hotel Statler, Detroit. Society address: 1916 Race St., Philadelphia. Secretary: Robert J. Painter.

March 2-6, Pittsburgh Section, American Chemical Society and Spectroscopy Society of Pittsburgh: Pittsburgh conference on analytical chemistry and applied spectroscopy, Hotel William Penn, Pittsburgh. Information: L. E. Pitzer, U. S. Steel Co., 525 Wm. Penn Place, Pittsburgh 30.

March 3-5, Society of Automotive Engineers: National passenger car, body and materials meeting, Hotel Sheraton-Cadillac, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

March 6, Bituminous Coal Research Inc.: Annual meeting, Netherland Plaza hotel, Cincinnati. Institute address: 2609 First National Bank Bldg., Pittsburgh 22. Secretary: C. A. Reed.

March 8-11, American Institute of Chemical Engineers: Annual spring meeting, Hotel Buena Vista, Biloxi, Miss. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

March 11, Foundry Education Foundation: Annual meeting and technical, university & industry advisory committee conference, Hotel Cleveland, Cleveland. Foundation address: Terminal Tower, Cleveland 14. Executive director: George K. Dreher.

March 11-12, Society of the Plastics Industry Inc.: Annual Canadian conference, General Brock hotel, Niagara Falls, Canada. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

March 15-19, American Chemical Society: Spring meeting, Hotels Statler and Biltmore, Los Angeles. Society address: 1155—16th St. NW., Washington 6. Assistant secretary: R. M. Warren.

March 16-18, National Association of Waste Material Dealers: Annual meeting, Hotel Conrad Hilton, Chicago. Association address: 271 Madison Ave., New York 16. Secretary: Clinton M. White.

March 16-20, National Association of Corrosion Engineers: Annual conference, Hotel Sherman, Chicago. Association address: 919 Milam Bldg., Houston 2. Secretary: A. B. Campbell.

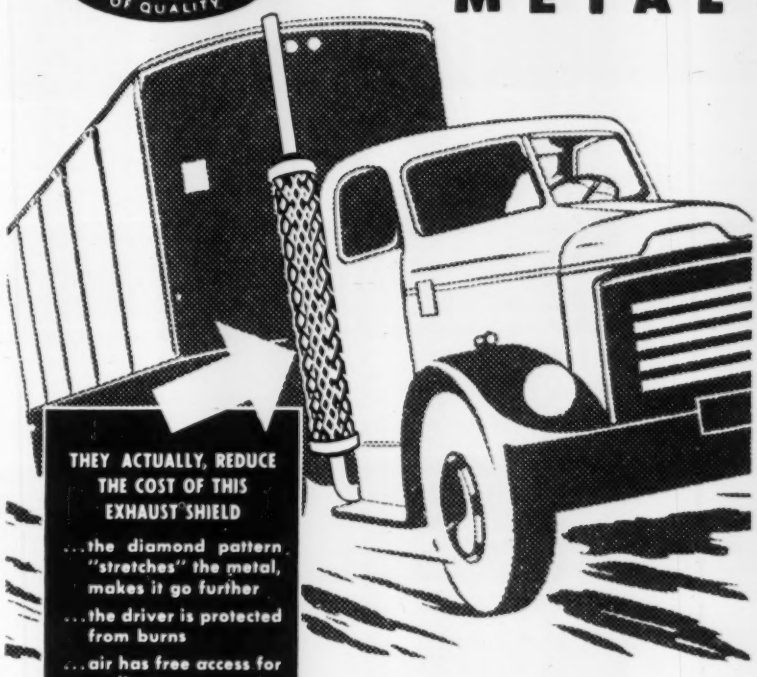
March 17-18, Steel Founders' Society of America: Annual meeting Edgewater Beach hotel, Chicago. Society address: 920 Midland Bldg., Cleveland. Secretary: F. Kermit Donaldson.

March 18-20, American Society of Tool Engineers: Annual meeting, Hotel Statler, Detroit. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: Harry E. Conrad.

Cheapest "Diamonds" You Can Buy

METAL MARK Penmetal 1869 OF QUALITY

EXPANDED METAL



THEY ACTUALLY, REDUCE THE COST OF THIS EXHAUST SHIELD

...the diamond pattern "stretches" the metal, makes it go further

...the driver is protected from burns

...air has free access for cooling

and you have an attractive product!

Manufactured of ⅛" 18 gauge PENMETAL by Toledo Pressed Steel Company for GMC Truck & Coach Company

EXPANDED METAL MESH

OPEN TO LIGHT, HEAT AND AIR. PENMETAL expanded metal is the material of economy—for protecting, for screening, for lightweight yet strong construction.

MAKES A LITTLE METAL GO A LONG WAY. PENMETAL expanded metal is sheet metal which has been slit, then stretched to as much as 10 times original area.

CORROSION-RESISTANT METALS AVAILABLE, as well as carbon steel. Large or small mesh, light or heavy gauge. Each sheet is a unit without rivets or welds.

UP TO 80% LIGHTER than solid sheet of same dimensions. Diamond truss pattern adds rigidity and strength.

METAL MARK Penmetal 1869 OF QUALITY

For more information, write for Free Bulletin EM50

PENN METAL COMPANY, INC.

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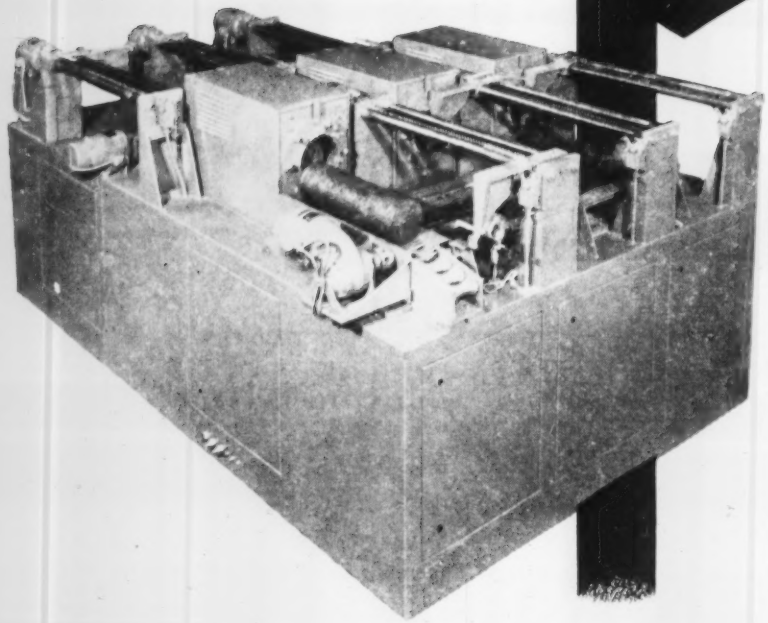
the first completely universal....

60-cycle **induction**

BILLET HEATER

THIS Loftus Universal Thermo-Induction furnace is the most flexible 60-cycle billet heater ever designed. You can heat every non-ferrous metal, in the same furnace, either consecutively or simultaneously, to its respective forging or extrusion temperature. The unit maintains high efficiency, constantly, even when heating **short-length** billets.

Loftus Thermo-Induction gives you the most practical, dependable, and efficient method of heating non-ferrous metals. You achieve uniform heating in a matter of seconds. Production is continuous, and completely automatic. The press operator controls the furnace. Separate, positive control of each coil is at his fingertips.



The Loftus 60-cycle Thermo-Induction Heater illustrated is designed to heat copper, brass, aluminum, and cupro-nickel for extrusion purposes. The unit is readily adaptable for forging and rolling processes. It is possible, with this billet heater to heat a 5" dia. Aluminum billet to 800° F., an 8" dia. brass billet to 1550° F., and a 10" dia. cupro-nickel billet to 1950° ALL AT THE SAME TIME, IN THE ONE FURNACE. Each billet is heated independently . . . from a single control panel.

Send Today for Booklet describing Loftus 60 Cycle Induction Heating in Detail

Loftus **ENGINEERING CORPORATION**

Designers and Builders of Industrial Furnaces

610 Smithfield Street • Pittsburgh 22, Pennsylvania

NEW PRODUCTS and equipment

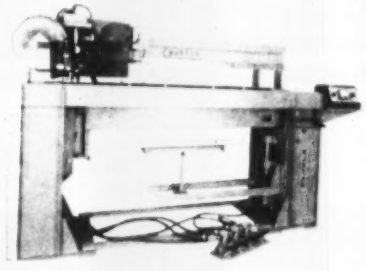
Reply cards on page 151 will bring you more information on any new products and equipment in this issue

Stake Welding Machine

. . . no seam separation

Stake welding machine incorporates clamping arrangement that provides clamping with no tendency for seam separation under load. It also provides less operator interference and better visibility in the welding area.

The stake, mounted on an air-actuated vertical slide, is supported



and aligned at the outer end by a manually-operated shot pin. Interlocking air valves protect the machine from improper operating sequence. A manually-operated gage bar is built into the machine. Morton Mfg. Co., Dept. ST, Muskegon Hts., Mich.

USE REPLY CARD—CIRCLE No. 1

Radio Frequency Generator

. . . speeds setup changes

Radio-frequency generator, 25 kw, is available in standard and de luxe models. Standard model is used where readjustment of generator wil be infrequent. Taps on the plate transformer provide power output control. The de luxe model uses saturable reactors to provide stepless power control. This facilitates quick setup change required on short production runs.

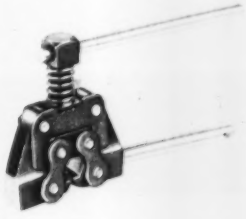
An electronic keying circuit is also included in the latter model to permit rapid and precise control of heat cycles. Westinghouse Electric Corp., Dept. ST, 401 Liberty Ave., Pittsburgh 30, Pa.

USE REPLY CARD—CIRCLE No. 2

Chain Breaking Tool

. . . disconnects pitch rollers

Chain breaking tool, model 60, will disconnect any pitch roller chain made to American Chain Manufacturers Association specifications, from $\frac{1}{4}$ to $\frac{3}{4}$-inch pitch. Jaws are malleable iron, heat treated. The pressing tip is case-



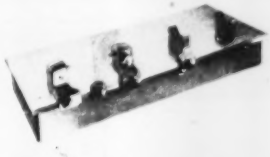
hardened tool steel. The tool is $5\frac{1}{2}$ inches long. Boston Gear Works, Dept. ST, 14 Hayward St., Quincy 71, Mass.

USE REPLY CARD—CIRCLE No. 3

Parts Inspection Unit

. . . rapid setup; less space

This integrated inspection unit incorporates devices required for close dimensional checking of pre-



cision machined parts. The basic unit includes five fundamental checking tools — a surface plate, bench centers, v-blocks, sine plate and indicator attachment. In addition, a concentricity attachment permits rapid checking of relative diameters and bores in round or square parts of variable outside diameters.

Increased convenience and quick setup is said to mean a savings in floor and bench space. Swanson Tool & Machine Products Inc., Dept. ST, 816 E. 8th St., Erie, Pa.

USE REPLY CARD—CIRCLE No. 4

Diamond Dresser

. . . for 10-inch wheels

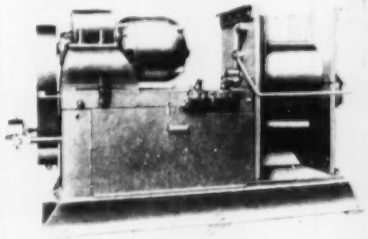
Designed for use on pedestal, hand, carbide surface, disk and toolroom grinders, the Dymondcut dresser can also be used for either angle or side dressing. It is recommended for wheels up to 10 inches in diameter. Hazerodt Associates, Dept. ST, 416 Ford Bldg., Detroit 26, Mich.

USE REPLY CARD—CIRCLE No. 5

Wire, Strip Scrap Bundler

. . . forms compact cylinder

Scrap bundler forms wire or strip into compact cylinders for easy handling, storing, shipping or remelting. It forms scrap into cyl-

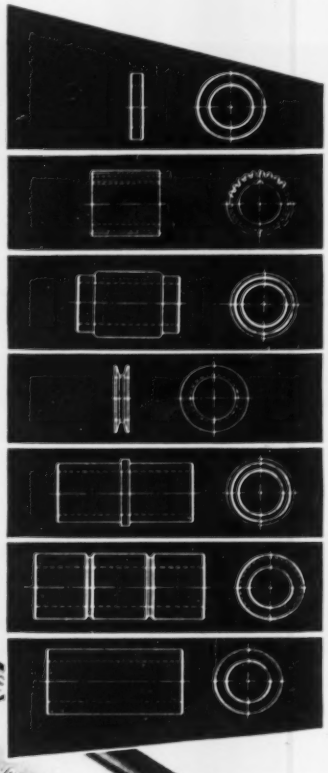


inders around a revolving spindle. Power is transmitted to the spindle through a sprocket and multiple strand roller chain drive system.

SAVE MACHINE TIME · · MONEY · · · USING JOHNSON UNIVERSAL BRONZE

THESE bronze bars have many uses, particularly where their free machining properties are important. Many manufacturers find Johnson Universal Bronze ideal for certain gears and pinions, guide rollers, sheaves, trolley wheels, tips for air tools, washers, thrust plates, as well as for bushings and bearings. The cost per pound is offset many times by the low cost of machining. Non-sparking properties and corrosion resistance recommend it for certain uses. Another big advantage is that Johnson Universal Bronze is available from distributors' stocks, fully machined, in solid bars $\frac{5}{8}$" to 8" diameters and in cored bars from $1\frac{1}{2}$" to $7\frac{3}{4}$" inside diameters—in all, over 400 sizes. Also available in hexagon bars from $\frac{5}{8}$" to 3" outside diameters. Each bar is usable from end to end, no waste.

JOHNSON BRONZE CO.
550 So. Mill St.
New Castle, Pa.



SEE YOUR JOHNSON DISTRIBUTOR
Sleeve Bearing Headquarters Since 1901

JOHNSON JB BEARINGS
Sleeve Type

NEW PRODUCTS and equipment

Spindle design includes a keyway connection with its drive sprocket, allowing it to be removed mechanically to discharge bundled scrap. Air pressure system is employed to discharge scrap.

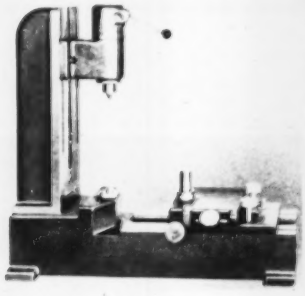
Bundler is available in two models. The first forms a roll 18 inches diameter and 18 inches long; the second produces rolls 24 x 24 inches. McLanahan & Stone Corp., Dept. ST, Hollidaysburg, Pa.

USE REPLY CARD—CIRCLE No. 6

Bench-Type Rolling Fixture

. . . checks integral-shaft gears

Model 602-A bench-type rolling fixture checks size, eccentricity and roll smoothness of cluster gears and similar types having integral shafts and centers The fixture has a spring-return, lever



controlled retractable upper center. Center distance is adjustable from 2 to 10 inches. Maximum distance between centers on the overarm is 12 inches.

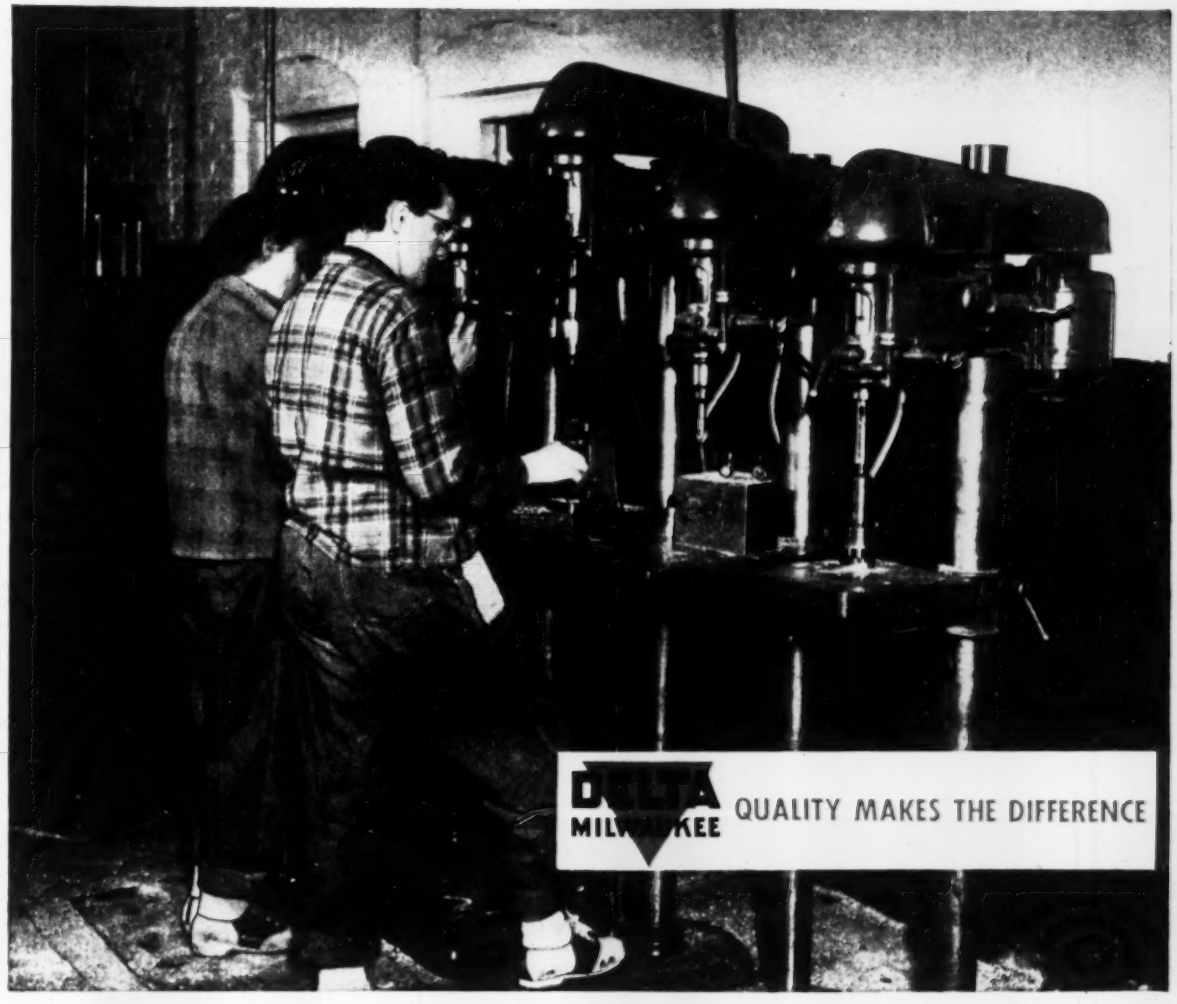
Correct tension between gears is maintained by spring-loaded ball ways. Turning the gear manually causes an 0.0005-inch indicator to show variations. Model can be used with the manufacturer's automatic recorder to place all readings on permanent charts. Michigan Tool Co., Dept. ST, 7171 E. McNichols Rd., Detroit 12, Mich.

USE REPLY CARD—CIRCLE No. 7

Metal Parts Degreaser

. . . employs ultrasonic waves

This cleaning machine uses ultrasonic waves to clean metal parts. It removes contaminants from the surface of small precision workpieces at a rapid rate and to a high degree of cleanliness. The Gen-



TELL US, MR. CURTIS——

Why did you buy 200 DELTA Drill Presses?

"Three vital advantages built into Delta Drill Presses explain why we use 200 of them," says Charles Curtis, Production V. P. of Copeland Refrigeration Corp., Sidney, Ohio . . .

"1. **PRECISION**—a must. We fight 'tenths' in this business; normally, .002" undersize is scrapped.

"2. **VERSATILITY**—you can mount Delta drill presses upside-down, sideways, gang them in numerous ways.

"3. **LOW INVESTMENT**—numerous permanent set-ups ready for all operations are vastly cheaper than a few that involve set-up time, labor and scrap cost resulting from constant changes of set-ups. We make a variety of plates, heads and parts, and can make a run on one piece simply by taking jigs and fixtures off the shelf.

Direct labor saving of $24,000 a year on one operation

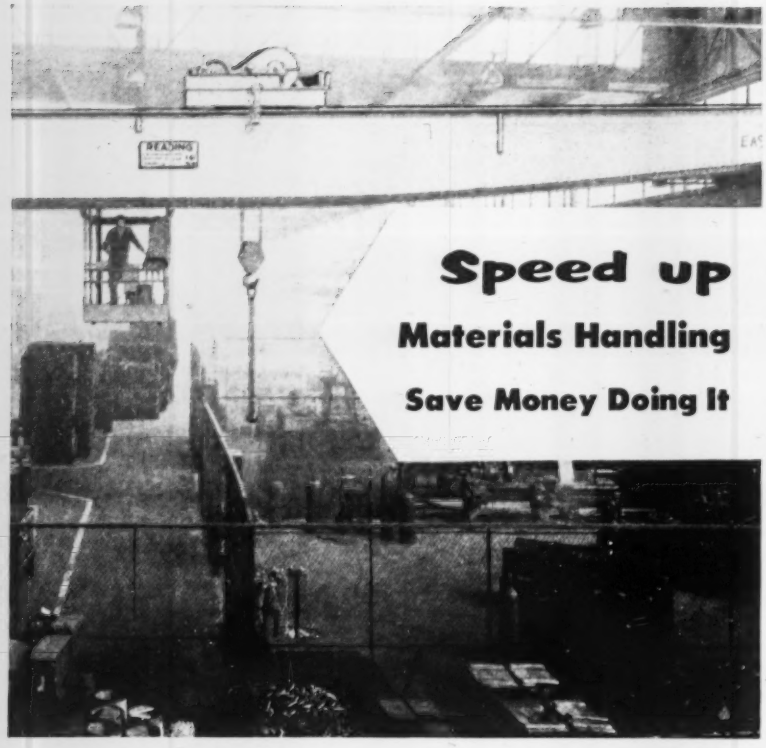
"As for special tools, here's one that out-performs a $16,000 radial drill press. We cut a Delta drill press pedestal in two, put an extension between, mounted the unit on an idle heavy base, fastened a swivel on each half-pedestal, mounting the drill head—and obtained a knee action that does all the radial drill did, only much better. The special Delta rig costing not over $300, operates at 2400 RPM as against 400 RPM; drills more than 200 pieces per day, as against 30-35 pieces; uses 3 men (always ahead of schedule) as against 7 men (always behind)—for a two-shift direct labor saving of $24,000 a year.

"No wonder we like Deltas."

Nothing here that a bit of ingenuity and common sense can't duplicate! —with cash benefits that can easily run big. Ask your Delta dealer for the latest Delta Catalog—listed in your Classified Directory under "Tools," —or write direct to Delta Power Tool Division, Rockwell Manufacturing Company, 6388 Lexington Ave., Pittsburgh 8, Pa.

DELTA QUALITY POWER TOOLS

Another Product by **Rockwell**



Yes, that's a strong promise. But it's being done right now in plants like yours. Here's how:

Match the requirement of your job with a custom-built Reading crane at no extra cost

Imagine, at what you'd normally pay for an "ordinary" crane, you can actually have one "tailor-made" for your own plant. For when you order a READING CRANE, our engineers offer you a choice of several interchangeable motor, trolley and hoisting units.

Known as UNIT CRANE DESIGN, this unique construction method assures greater operating efficiency. It enables you to move more materials at the lowest possible cost. And it helps you reduce maintenance time and save maintenance dollars—any unit can be removed for overhauling or repair without dismantling any other unit!

READING CRANE & HOIST CORPORATION 2102 Adams St., Reading, Pa.

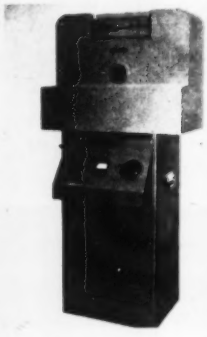
READING CRANES

CHAIN HOISTS | OVERHEAD TRAVELING CRANES | ELECTRIC HOISTS

NEW PRODUCTS and equipment

eral Electric-developed and manufactured ultrasonic generator is used with special vapor degreasing equipment to complete the model.

Generator converts high-frequency electrical energy into mechanical vibration by a quartz crystal. Energy is transmitted through the cleaning tank. After cleaning action, parts are rinsed and dried by the vapor process. Equipment is available in continuous production or batch-type methods. Topper Equipment Co., Dept. ST, Rahway, N. J.



USE REPLY CARD—CIRCLE No. 8

Adhesive Systems

. . . available as liquid, mortar

Adhesive systems for bonding foamed styrene to metal or other surfaces are available as liquids or mortars. They can be sealed by pressure contact to secure high bond strengths. Products are known as Amphesive 801 and Alfane. Atlas Mineral Products Co., Dept. ST, Mertztown, Pa.

USE REPLY CARD—CIRCLE No. 9

Automatic Test Stand

. . . checks seamed tubing

Automatic, air and hydraulically actuated test stand determines physical characteristics of any seamed tubing up to 3 inches diameter. Test specimens of steel, stainless steel and carbon steel tubing can be checked easily for flaring, column and crushing strength with pressures up to 100,000 pounds.

Stand is self-contained, has a hinged safety guard and requires only a connection to 60 to 80

tool steel is our baby!

Tool steel is our baby. It has been for 52 years. It always will be. That's why tool steel users look with confidence to Crucible.

Crucible's research and development continues to match industry's need for new and improved tool steels. Our metallurgical staff — with a background of thousands of applications is freely available to you. Complete stocks of tool steels are maintained in our conveniently located Crucible Warehouses, for prompt delivery. Turn confidently to Crucible for all your tool steel requirements.

SEND TODAY for the unique Crucible Tool Steel Selector — a twist of the dial gives the tool steel for your application.

Rex® High Speed Steels
Peerless Hot Work Steels
Halcomb 218
Chro-Mow®
Sanderson Carbon Tool Steels
Ketos®
Airkool Die Steel
Airdi® 150
Nu-Die V Die Casting Steel
CSM 2 Mold Steel
La Belle® Silicon #2
Atha Pneu

SPECIFY YOUR TOOL STEELS BY THESE BRAND NAMES

Crucible Steel Company of America
Dept. S, Chrysler Building, New York 17, N. Y.

Name_____

Company_____ Title_____

Address_____ City_____ State_____

9" diameter, 3-colors

CRUCIBLE first name in special purpose steels

52 years of Fine steelmaking

TOOL STEELS

The first heat was tapped from this 60-ton Lectromelt Furnace on May 13, 1952.
Today it's producing steel at a rate of over 100,000 tons annually.

AFTER 8 MONTHS OF *Lectromelt** FURNACE OPERATION, ATLANTIC STEEL HAS THIS TO SAY

It's too soon to draw final conclusions, of course, comparing electric furnace operation with our open hearths. Production continues to rise and costs are coming down, as procedures are smoothed out. But we have made these observations:

- Time per heat is about half that required by an open hearth.
- Average down time is much less, even for major repairs. An electric furnace is available 94% of the time.
- Average size of heat 67.12 tons. Yield per ingot is 5% better.
- Metal cost is lower because we don't use pig iron with the electric furnace.
- Fewer man-hours per ton are required.
- After only five months, we got our electric furnace steel costs down below those of our open hearths.

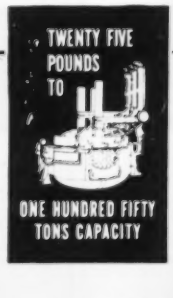
Atlantic Steel Company laid out their plant, from scrap storage yard to pouring pit, around this Lectromelt Furnace. This certainly contributes greatly to these economies. Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh 30, Pennsylvania.

Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa.

*REG. T. M. U. S. PAT. OFF.

MOORE RAPID

WHEN YOU MELT... *Lectromelt*



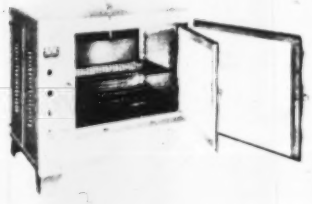
pounds air supply. After specimen is inserted between fitting anvils, operation is by solenoid, pushbutton controlled. Dommers Co., Dept. ST, 428 S. Cherry St., Wallingford, Conn.

USE REPLY CARD—CIRCLE No. 10

Relative Humidity Tester

. . . promotes direct circulation

This constant temperature-humidity cabinet is designed for all tests involving 90 to 100 per cent relative humidity, from 4 to 70° C



dry bulb temperature. Counterflow baffle maintains a direct, definite chamber atmosphere circulation while saving cooling water when testing at temperatures below the ambient temperature.

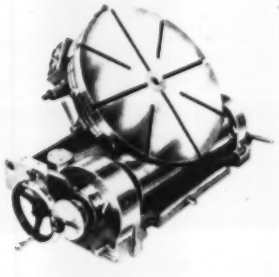
Automatic thermostat controls temperature with response sensitivity of plus or minus ½° C. Model is available in four standard sizes from 1 to 9 cu ft chamber. Blue M Electric Co., Dept. ST, 306-08 W. 69th St., Chicago 21, Ill.

USE REPLY CARD—CIRCLE No. 11

Tilting Rotary Table

. . . power rotation included

This 24-inch diameter tilting rotary table is provided power rotation by a 3-phase, ½-hp shell-type



motor built into the table pivot. Table can be rotated through 360 degrees in either direction and in

Looking for something Special?

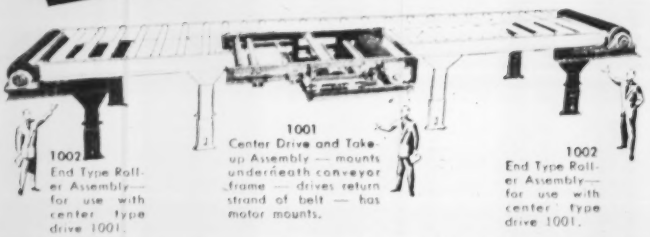
● Special fasteners are our specialty. Use our experience to solve your problems with Circle B bolts designed and made to your particular requirements. You can improve your product design and performance . . . while cutting assembly time and costs.

● Look to Buffalo Bolt for the direct answer to your fastener problems. Start right by writing for details today. Your inquiry will receive special attention, too. Ask for standard fastener Catalog No. 51 when you write.

B BUFFALO BOLT COMPANY
Division of Buffalo-Eclipse Corporation
North Tonawanda, N. Y.
Sales Offices in Principal Cities
PRODUCERS OF CIRCLE B PRODUCTS — BOLTS • NUTS • RIVETS AND SPECIAL FASTENERS

Now...ENGINEER AND ASSEMBLE YOUR OWN CONVEYOR WITH

Standard HANDIDRIVE 1000 SERIES PRE-BUILT POWER CONVEYOR UNITS


1002
End Type Roller Assembly — for use with center type drive 1001.
1001
Center Drive and Takeup Assembly — mounts underneath conveyor frame — drives return strand of belt — has motor mounts.
1002
End Type Roller Assembly — for use with center type drive 1001.

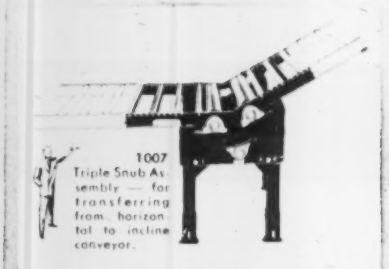
HANDIDRIVE 1001-1002 PRE-BUILT CONVEYOR UNITS

This Center Drive and Takeup Assembly drives return strand of belt—mounts underneath conveyor frame — can be used to convert present gravity conveyors to live, or powered, belt or roller conveyor or to make additions or changes to existing power conveyors. Unit 1002 is End Type Roller Assembly for use with 1001 Center Drive Assembly.

1006
End Type Drive Unit — for use with drive at head end of conveyor — has motor mounts.
1008
End Type Takeup — for use at tail end of conveyor when End Type Drive 1006 is used.

HANDIDRIVE 1006-1008 PRE-BUILT CONVEYOR UNITS

1006 is an End Type Drive Unit for use with drive at head end of conveyor. 1008 is an End Type Take-up for use at tail end of conveyor when End Type Drive 1006 is used. These two stock units make it an easy and simple matter to put together a complete power conveyor line.



HANDIDRIVE 1007 PRE-BUILT CONVEYOR UNIT

This is a Triple Snub Assembly Unit for placing in a conveyor line for transferring flow of commodities from horizontal to incline. Another of Standard's stock units that provide flexibility of planning and arrangement in making your own custom-built conveyors.

Send today for HANDIDRIVE 1000 Series and complete information. Conveyor-engineering service is offered without obligation. Series "400" and "700" units also available for lighter load applications. Write Dept. ST23.

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul 9, Minnesota
Sales and Service in Principal Cities

Send for special bulletin HANDIDRIVE 1000 Series and Bulletin 638 describing Standard Gravity and Power Conveyor Units.

NEW PRODUCTS and equipment

any plane of arc, by pushbutton controls. For fine adjustments, table is rotated by a handwheel with self-centering spinner knob.

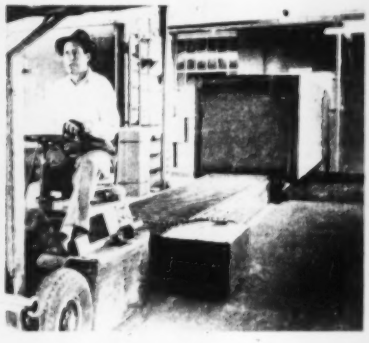
The table can be tilted from 0 through 90 degrees. Rapid elevating handwheel is provided for fast positioning. Arc settings are made in degrees using a graduated quadrant on the face of the table pivot. Pratt & Whitney, division of Niles-Bement-Pond Co., Dept. ST, W. Hartford 1, Conn.

USE REPLY CARD—CIRCLE No. 12

Retractable Boom Conveyor

. . . connects two buildings

Boom conveyor can be extended across a passageway or railroad siding to connect two buildings, but be withdrawn to permit passage of cars. The live roller boom



is equipped with fully-enclosed drive mechanism and the entire mechanism is self-contained.

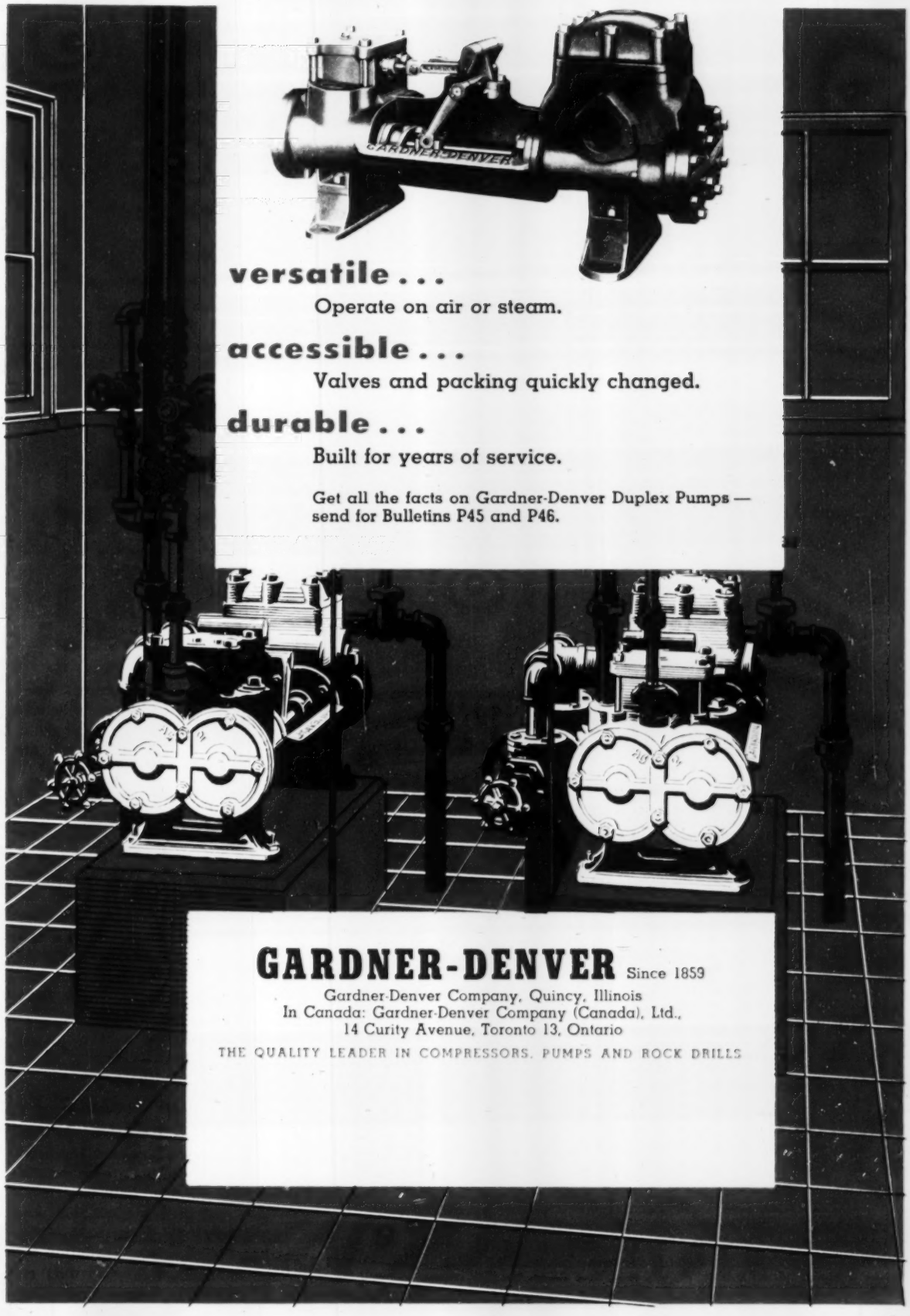
An enclosure is constructed to protect packages as they pass between the two buildings. This enclosure rides on the conveyor frame and is an integral part of the structure. Alvey Conveyor Mfg. Co., Dept. ST, 9301 Olive St., St. Louis 24, Mo.

USE REPLY CARD—CIRCLE No. 13

Cutting Oils

. . . keeps tools cool

Additives have made possible four Sunicut cutting oils which keep parts and tools up to 50 degrees cooler. Sunicut 11-S and 209-S are nonstaining, dual purpose oils developed primarily for medium duty and heavy duty operations on automatic screw machines. Oils



versatile . . .

Operate on air or steam.

accessible . . .

Valves and packing quickly changed.

durable . . .

Built for years of service.

Get all the facts on Gardner-Denver Duplex Pumps — send for Bulletins P45 and P46.

GARDNER-DENVER Since 1859

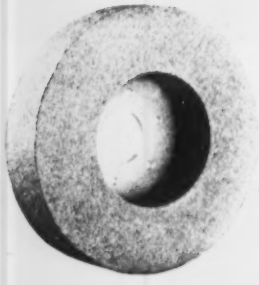
Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd.,
14 Curity Avenue, Toronto 13, Ontario

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

but . . . for carbide tool grinding

SIMONDS WHEELS

cost much *less*



SIMONDS ABRASIVE CO.

Grinding Wheels

Sharpen *your* carbide tools the economical way. Avoid damaging sensitive edges. Prevent shape distortion. Use Simonds' G Electrolon (silicon carbide) grinding wheel. It's the popular "green" wheel . . . less expensive than diamond wheels . . . but a "gem" for safe, cool grinding that prolongs tool usefulness.

Especially efficient for roughing and semi-finishing, these wheels are also frequently used for finishing, too. Made to high standards of accuracy, as are all Simonds Abrasive Company products . . . including grinding wheels, mounted wheels and points, segments and abrasive grain.

Write for your copy of our bulletin (ESA 181) about G Electrolon wheels, including type PM (plate mounted) and tool and cutter shapes. *All* available from stock. Your Simonds Abrasive distributor is equipped to serve you locally. We'll gladly send you his name too.

SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON
DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y. Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

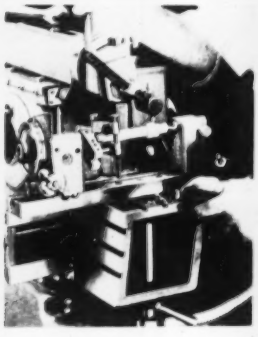
102-S and 110-S both contain active type sulphur and are effective for heavy duty screw machine work and other heavy duty operations such as broaching, gear-hobbing and tapping. Sun Oil Co., Dept. ST, 1608 Walnut St., Philadelphia 3, Pa.

USE REPLY CARD—CIRCLE No. 14

Indexing Centers

. . . for small precision work

This indexing center is designed for small precision work; takes stock up to 5 inches diameter, 6 inches long. Made for dividing operations, such as machining splines, flutes and gears, the device is also used for milling, shaping and grinding squares, hexagons or odd angles.



A ball crank and worm gear, equipped with graduated collar, turns head center. For quick center positioning, the worm gear can be disengaged and a clamping device locks the head center in any desired position. Plunger type tail center with automatic spring tension permits removal of the work without disturbing the head center. South Bend Lathe Works, Dept. ST, South Bend 22, Ind.

USE REPLY CARD—CIRCLE No. 15

Electric Impact Wrench

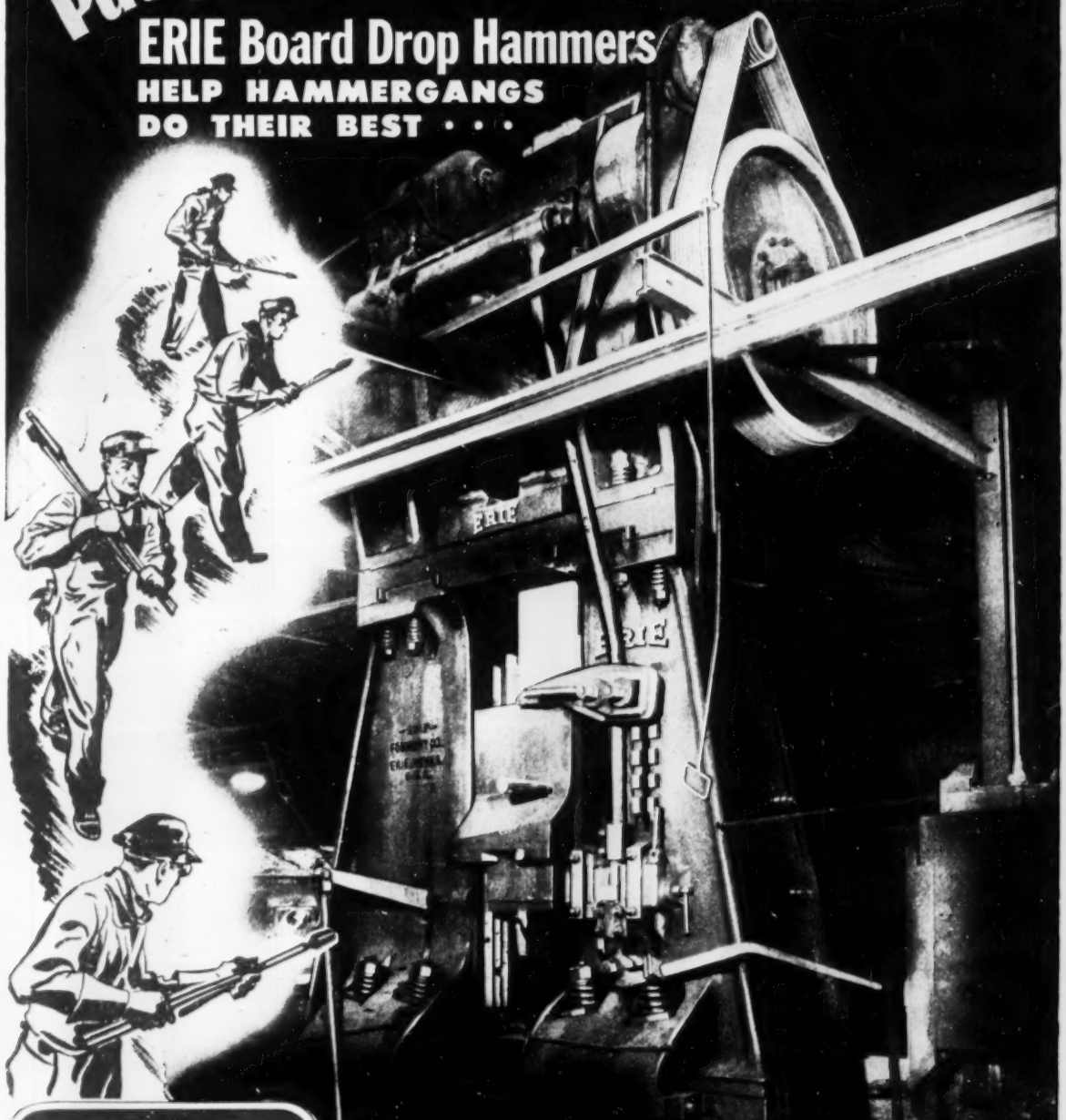
. . . with forced ventilation

Model 4EW Tork-Hammer features a housing die cast of aluminum alloy, pistol grip with detachable side handle, built-in trigger switch with lockring pin, ball and needle bearings, heavy duty gears. It has forced draft ventilation for cool running and a heavy duty reversible universal type alternating-

Put YOUR Men in this Picture....

ERIE Board Drop Hammers

HELP HAMMERGANGS DO THEIR BEST • • •



ERIE

Write For Bulletin No. 102

ON ERIE HAMMERS ALL STRESSED PARTS, UPPER WORKS, FRAME AND ANVIL ARE STEEL.

ERIE FOUNDRY COMPANY • ERIE, PA.

ERIE BUILDS *Dependable* HAMMERS

Easily adjustable head and table speeds changeover from job-to-job...

New Heavy-Duty Alfing Drill Press

Immediate delivery from stock

Just turn the crank to raise or lower the table—slide the headstock 6" up or down by hand—lock in position—and the Alfing Drill Press is ready to go to work on your short- or long-run heavy duty production jobs. Easy-to-reach controls cut your handling time, too.

Built to take it, the Alfing Model BK-25 combines all the operating advantages that made it one of Europe's top producers for 40 years, *plus* many new design features to meet the operating requirements of American mass-production...like these:

Adjustable table and headstock. Scraped ways assure accurate alignment.

9" quill-supported spindle stroke, driven by V-belt motor.
Motor speed 900 rpm.

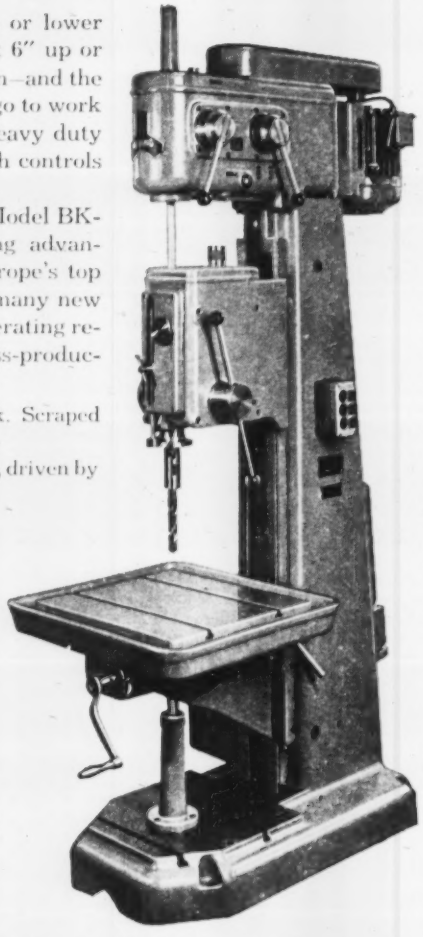
Drilling capacity of 1" in steel; 1 1/4" in cast iron.

Adaptable for boring, countersinking, milling and reaming.

8 spindle speeds from 150 to 1640 rpm in geometrical progression. Spindle carried in precision ball bearings.

Drilling feed by hand or power. With power, feeds of .003", .006" or .009" per spindle revolution are available. Power feed may be engaged or disengaged at any position of spindle. Drilling depth set by quick indexing stop.

Want more details on this and other Orban equipment? Write today.



New Alfing BK-25 Drill Press with 26" x 28" table surface. Distance between spindle and table, 23" max.; spindle and base plate, 25"-40". Scraped base plate may be used as table for extremely bulky work pieces. 3½ h.p. motor.

Engineered servicing and stock parts within 48 hours from Orban Service Centers in Newark, Detroit, Cleveland.

KO CO., INC. INDUSTRIAL IMPORTERS

KURT ORBAN COMPANY, INC.

205 East 42nd St., New York 17 - 4220 Prospect Ave., Cleveland 3
19450 James Couzens Highway, Detroit 35 - 1939 Santa Fe Ave., Los Angeles
Canadian sales by European Machinery Ltd., 11 King St. West, Toronto, Can.

NEW PRODUCTS and equipment

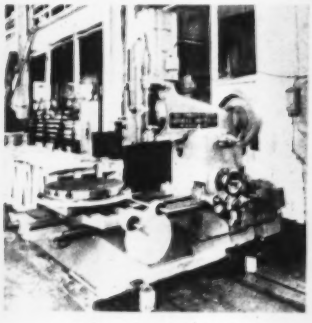
direct current motor of 115-230 v current. Mall Tool Co., Dept. ST, 7725 S. Chicago Ave., Chicago 19, Ill.

USE REPLY CARD—CIRCLE No. 16

Redesigned Slotting Tool

. . . easier, safer operation

Easier maintenance, safer operation are incorporated in this improved slotting tool. Improvements include a completely enclosed counterweight on the ram. Forced feed



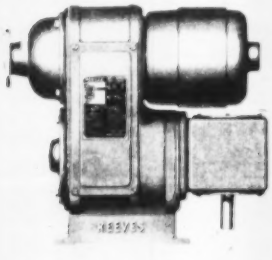
lubrication circulates oil to all moving parts. A gear-guarding arrangement encloses all moving gear banks in sections. Lobdell United Co., Dept. ST, 2000 G St., Wilmington 99, Del.

USE REPLY CARD—CIRCLE No. 17

Fractional Horsepower Drives

. . . with right-angle reducer

Fractional horsepower variable-speed drive is designed with a right angle reducer. The unit combines in a single design any NEMA frame, type C, face-mounted mo-

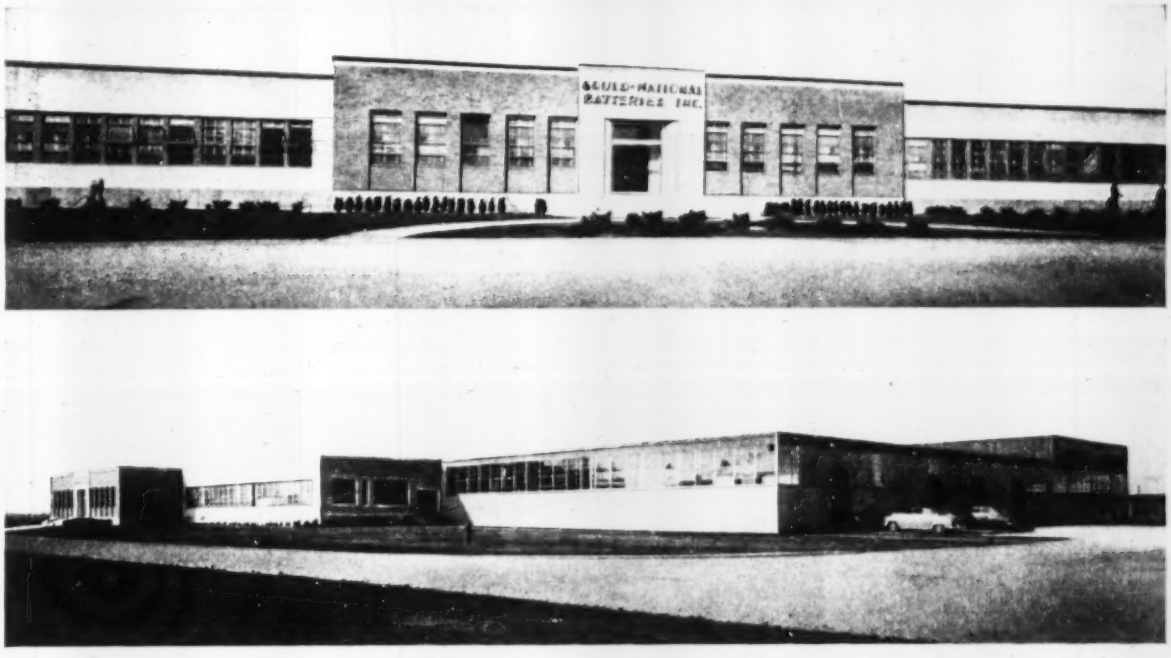


tor; speed-varying mechanism; and right angle worm gear reducer. Reducer is available on all fractional horsepower drives in either horizontal or vertical models, with speed ratios from 2 to 1 through 10 to 1.

Output shaft drives up, down or

GOULD OPENS 21ST PLANT

TO MEET INDUSTRIAL BATTERY DEMAND



Front and side views of Gould's new Kankakee, Ill., plant

GOULD'S NEW KANKAKEE PLANT which went into production on November 10 is the 21st Gould plant in the United States and Canada. Devoted entirely to the manufacture of storage batteries for industry, it gives Gould the additional capacity necessary to meet the increased demand for Gould batteries in all parts of the country. Thanks to these new facilities, Gould customers can expect even faster service than before.

GOULD *Industrial Batteries*

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, N. J.

Always Use Gould-National Automobile and Truck Batteries

cold forged

metal fasteners

For (√) high quality material, (√) precise machining, (√) fast assembly, and (√) good appearance, specify CHANDLER cold forged metal fasteners. They are manufactured from tested high quality alloy steel by the most modern machinery and methods. Every fastener must pass rigid inspection to make sure it meets your specifications. This uniform high quality makes assembly faster, and smoothly finished heads assure good appearance of the completed assemblies.

Specialists in Alloy Bolts . . . Grinding to close tolerances . . . Drilled heads or shanks. Diameters 1/4" 5/16" 3/8" to 3" in length and diameters 7/16" 1/2" 9/16" to 5" in length.

EACH

Manufacturers of Place Self Locking Bolts

Chandler Products Corp.

1488 Chardon Road • Cleveland 17, Ohio

NEW PRODUCTS and equipment

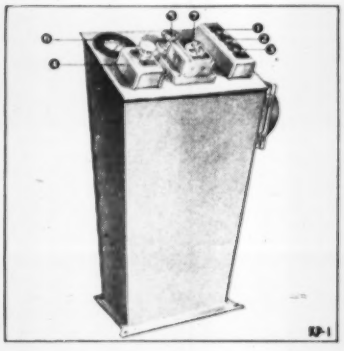
at right angles in the horizontal type; down or at right angles in the vertical model. Handwheel control is standard, but electric remote and mechanical automatic controls can be applied. Reeves Pulley Co. Inc., Dept. ST, Columbus, Ind.

USE REPLY CARD—CIRCLE No. 18

Improved Friction Saws

. . . pushbutton control added

Pushbutton control stand is available for operating the manufacturer's large model friction saws. All operations and feed adjustments are regulated from a central con-



trol stand. Central controls include operation of coolant.

In addition to convenience, an advantage is seen in elimination of the possibility for running the saw without water. Kling Bros. Engineering Works, Dept. ST, 1302 N. Kostner Ave., Chicago 51, Ill.

USE REPLY CARD—CIRCLE No. 19

Bushing Driver

. . . for threaded inserts

Design features of the bushing driver provide automatic positioning of threaded inserts to the proper depth below the face of the casting. A ball bearing pressure plate prevents backing the insert

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

70. Success Factors

Harold F. Howard Co.—"Today's 25-Point Check List for Top Management" is 6-page bulletin 117-3 which lists factors vital to success of an industrial firm. It covers cost accounting, budget controls, production and quality control, executive training, bonuses, staff organization, manufacturing methods, development programs and market analysis.

71. Filtration Equipment

Hoffman-Crane Corp.—One of two 4-page bulletins explains how automatic filtration and handling equipment keeps oils and coolants in safe, like-new condition indefinitely. Second bulletin describes and illustrates typical individually engineered oil filtration and handling systems and offers case history briefs on company facilities and services.

72. Electrical Furnaces

Russ Electric Furnace Co.—Two illustrated bulletins "For More Than 25 Years" and "Electrical Furnaces for Industry" are comprised of 4 and 8 pages of data, respectively, on German-made induction melting furnaces, annealing and tempering units, heat treating furnaces and processing furnaces.

73. Sheet Steel Separator

Basco Mfg. Co.—Two sizes of Basco magnetic sheet steel separators are described and illustrated in 2-page bulletin. One is three-high heavy duty unit and other is smaller two-high unit. Height, width, number of magnets, and maximum stack height are covered. Unit speeds feeding of sheets and strips to presses and other machines.

74. Dust Control Units

W. W. Sly Mfg. Co.—By frequent blasts of reverse air, the cloth screen dust collector prevents accumulation of dust on the cloth bags. This is one of the main features of Dynaclone line of dust control units described in 8-page illustrated bulletin 102. Dimensional drawings, specs and a feature on how to engineer a dust problem are included.

75. Vapor Degreasing

E. I. du Pont de Nemours & Co., Electrochemicals Dept.—"Vapor Degreasing with du Pont Nonflammable Solvents" is title of 16-page booklet A-9865 which tells how trichloroethylene is used in fast, thorough metal cleaning. The process is explained, solvents are discussed, and equipment and applications are illustrated.

76. Chimney Building

Rust Engineering Co.'s chimney building service to industry is described in 4-page folder. Some of the many radial brick and reinforced concrete chimneys built by Rust can be viewed in the 23 illustrations of the folder. Literature also depicts one of country's tallest chimneys in various stages of construction.

77. Air Control Valves

Valvair Corp.—In the 8 illustrated pages of "Valvair Diversatility" you will find air control valves which meet almost countless requirements. Three basic body designs in five types and five sizes for nine control assemblies are shown, their specs given and some applications shown.

78. Diversified Fastener Line

Simmons Fastener Corp.—Suited to a variety of applications, the line of fasteners described and illustrated in 36 pages of catalog 1252 include Quick-Lock, Spring-Lock one-piece blind fastener, Roto-Lock butt-joint panel fastener, Link-Lock container lock where preloaded closures are desired. Dimensional, engineering and application data are given.

2-9-53

STEEL
Penton Building, Cleveland 13, Ohio

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5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
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Reader Service Dept.

79. Metal Bath Chemical

American Cyanamid Co. Technical data sheet on Aerobeat 1200-R explains proper use of this highly concentrated reclaimer for "neutral type salt baths under extreme operating conditions." This chemical settles baths that have been idle for long periods of time without addition of fresh salts.

80. Diamond Finishing

Elgin National Watch Co., Abrasives Div. Efficient application of diamond abrasives is described and illustrated in 8-page bulletin which also contains basic information on the characteristics of diamond as an abrasive. Catalog data on Elgin diamond abrasives is given.

81. Chart Holders

Visi-Trol Corp. Type A quality control chart holders for "in process" records and type B holders for permanent records are subject of 4-page illustrated bulletin 159-22. The Visi-Control "in control-out of control" signal system that avoids delay in maintaining quality is described also.

82. Welding & Cutting Units

Victor Equipment Co. — Welding and cutting tools and equipment to meet practically every need are described in compact pocket-size 20-page illustrated booklet 330. Flame cutting, heating and welding units are detailed and priced.

83. Wire & Cable Data

United States Rubber Co.—186-page illustrated general catalog offers data on more than 500 different types of electrical wires and cables. Construction, operating characteristics and other information are given on control and signal cables, railroad wire and cables, distribution conductors, communications wires and cables, and portable cords.

84. Cutting Fluids

D. A. Stuart Oil Co.—A brief study of cutting and grinding fluid functions as concerns their selection and application is presented in 4-page booklet entitled "More Than A Coolant Is Needed."

85. Hot Spray Finishing

Arco Co. "The Arco Hot Spray System: How it Fits into Your Finishing Operation" is an information-packed 12-page illustrated booklet that shows the economy and simplicity of a system that can be utilized with existing spray finishing systems or integrated with proposed production finishing lines.

86. Story of Gas Combustion

Surface Combustion Corp. "Heat in Harness" is title of a 16-page illustrated booklet which tells the story of gas combustion and the growth of a large manufacturing organization built around its diversified applications. Technology and engineering in aircraft heaters is detailed.

87. Low Cost Tonnage Oxygen

Blaw-Knox Co., Chemical Plants Div. 24-page illustrated booklet describes oxygen and other low temperature separation processes, including the Linde-Fraenkl process for low cost tonnage oxygen production. Flow sheet and typical plant layouts are given. Investment and operating costs are discussed.

EDITORIAL REPRINTS:

88. Air Power in Plants

Versatility and low original cost stimulate the use of air power in small plants. STEEL reprint entitled "Air Keeps Small Plant in the Running" relates how pneumatic vises, chucks and ejectors boosted production for the Aero Fastener Corp. of Burbank, Calif.

89. Cutting Down Time

When a machine operator takes time between jobs to look for tools and find his new job, valuable machine-time goes down the drain. Warner & Swasey Co. of Cleveland scheduled this down time to a minimum by organizing the flow of jobs and selection of tools. The full story is in STEEL reprint "Schedule to Slice Out of Down Time."

90. Distortion

Distortion is still a major problem facing the tool and die maker, even with air-hardening grades of steel and good controlled atmosphere furnaces. In STEEL reprint "Distortion It Can be Minimized in Heat Treating," A. L. Prasses of Westinghouse Electric Corp. discusses bending, creep, residual stresses, anisotropic growth and differential transformation along with some solutions.

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STEEL

Penton Building, Cleveland 13, Ohio

2-9-53

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out after driving. Drivers are equipped with ½-inch female square drive to drive threaded inserts 0.010-inch below face of casting. Titan Tool Co., Dept. ST, Main St., Fairview (Erie County), Pa.

USE REPLY CARD—CIRCLE No. 20

Hand Truck-Trailer

. . . handles palletized loads

Combination hand truck-trailer has 4000-pound capacity to handle palletized loads. The all-steel, caster-steered trailer is equipped with a simple brake mechanism to permit easy manual control of the hand truck and load when operating on grades. Flush deck construction makes it especially suitable for hauling pallet loads.

Safety self couplers at each end equip it for trailer duty in trackless train operations. Mercury Mfg. Co., Dept. ST, 4130 S. Halsted St., Chicago 9, Ill.

USE REPLY CARD—CIRCLE No. 21

Dry Lubricant

. . . for metal forming operations

Drawcote is a dry lubricant for use in metal forming operations. When applied to metal and dried, it forms a dry, protective and lubricating film. Once coated, stock can be stored for long periods, then used as desired without any reapplication or additional lubricant. Gilron Products Co., Dept. ST, 6007 Euclid Ave., Cleveland 3, O.

USE REPLY CARD—CIRCLE No. 22

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

for a fabulous finish...

JEWEL BRAND
Abrasive Belts

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

The Market Outlook

DON'T WORRY about a general increase in steel prices. It won't come with death of price controls, even though steel is in such strong demand that the industry is operating at capacity to fill orders.

Here's why: Steel supply is catching up with demand. The steel industry won't want to risk incurring adverse public reaction a general price increase might bring. Such an increase might be considered unfair to President Eisenhower, who announced intention of freeing the economy from price and wage controls. The industry will not wish to embarrass an administration which is working for a free economy.

LOOK FOR THESE—But you can expect some adjustments in steel prices and a resumption of movement of prices. Adjustments, most of them upward, will be needed to correct imbalances that have risen in a rigid structure of prices under government controls. Then the resumption of movement of prices, up and down, in response to demand and production costs will tend to maintain balance among prices.

COST CONSCIOUS—Supporting the belief there will be no general increase in steel prices is the growing cost consciousness of buyers. Another evidence of that is seen in the Boston area where some jobbers and consumers are not taking all of the large cold-finished bars they are entitled to for the second quarter under government allotments. Although large bars have been particularly insufficient in supply, these buyers turned down the tonnage because it would have to come from the Pittsburgh district, and that would involve considerable freight charges.

WHAT'S EXPECTED—While some of the major forms of finished steel are in strong demand, a decided improvement in the balance between supply and demand is expected by three months from now, a survey by STEEL shows (see page 59). Much of the strong demand in the last several months has come from efforts of consumers to rebuild their steel inventories that were pulled down by last summer's strike of steelworkers. That this rebuilding is pretty well accomplished is revealed in STEEL's survey. Majority of those reporting say they have a 30 to 60-day supply. Some even have a 60 to 90-day supply even though only a 45-day supply is legal under government controls.

PRESSURE POINTS—Most concerned over difficulty in obtaining the forms of steel that are in strongest demand are small consumers and automotive suppliers, STEEL's survey indicates. That is logical. Small consumers feel they do not pack enough weight to receive preferred treatment, and the automotive suppliers are trying to keep pace with the production drive of the auto industry.

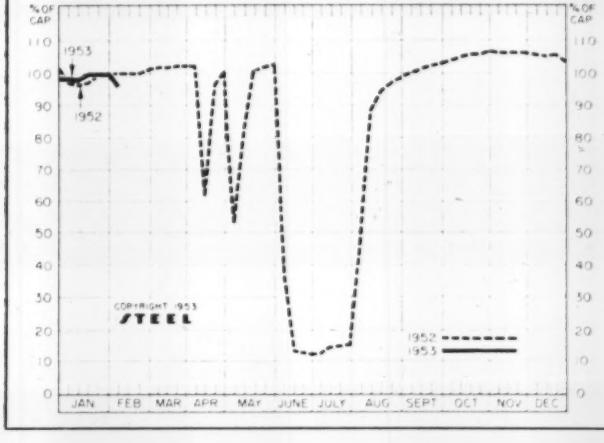
The auto industry's production push is putting steel sheets about on a par with large bars and heavy plates as the hardest-to-get items. Other quarters from which a strong demand is coming for sheets are makers of pressed metal sanitary ware, refrigerators and deep freeze units, radio and television, including television tubes, and air-conditioning equipment.

BECOMING SELECTIVE—Nevertheless, the trend toward balance between supply and demand in the steel market continues. This is evidenced by an increase in refusals of warehouses to accept substitutes as to sizes and grades.

Return toward the normal of a competitive market extends clear back to one of the raw materials going into steel—scrap. The easing in demand is spreading geographically, and also as to grades of scrap. In some areas now this easing is being reflected in price cuts in steelmaking grades.

PRODUCTION DECLINES—Steel production in the week ended Feb. 7 fell to the lowest level since mid-December, but this drop was caused by a strike at the Indiana Harbor, Ind., Works of Inland Steel Co. The national rate was 97.5 per cent of capacity, compared with 99.5 per cent in the preceding week.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Feb. 7	Change	Same Week 1952	Same Week 1951
Pittsburgh	100.5	0*	100.5	96
Chicago	91.5†	-6	102	94.5
Mid-Atlantic	97†	+2	96	98.5
Youngstown	106	0	106	106
Wheeling	100	1	100	97
Cleveland	103†	+8	95	95
Buffalo	106	0*	101	101
Birmingham	98	+2	101	100
New England	89†	0	90	85
Cincinnati	93	-2.5	77	106
St. Louis	100.5	-1.5	95	98.5
Detroit	101.5	0	106	101.5
Western	110	+3	100	103
Estimated national rate	97.5†	2	100	97

*Change from preceding week's revised rate.
†Estimated rates are based on Jan. 1, 1953, capacities; others, on Jan. 1, 1952, capacities.
Weekly steelmaking capacity is estimated at 2,248,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 51 Production Engineering News—p. 87

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics	Feb. 3 1953	Jan. 27 1953	Month Ago	January Average
(1947-1949 = 100)	130.5	130.6	130.7	130.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Feb. 3, 1953

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$5.275
Track spikes	6.650	Sheets, galv.	6.845
Track bolts	9.958	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.060
Plates, carbon	4.180	Pipe, galv., buttweld (100 ft)	8.822
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.575	Terne plate (100 lb base box)	7.760
Bars, stainless (lb)	0.149	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv.	6.425
Bars, reinforcing	4.050	Nails (100 lb keg)	7.410
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spool)	5.850
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.625

FINISHED PRICE INDEX, Weighted: Calculated by STEEL*	Feb. 3 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av. = 100)	181.31	181.31	181.31	171.92	134.56
Index in cents per lb	4.912	4.912	4.912	4.657	3.645

ARITHMETICAL PRICE COMPOSITES: Calculated by STEEL*					
Finished Steel NT	$110.98	$110.98	$110.98	$106.32	$78.59
No. 2 Fdry. Pig Iron, GT	55.04	55.04	55.04	52.24	39.69
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	39.219
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	40.30
Steelmaking Scrap, GT	43.00	43.00	43.00	43.00	40.58

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Feb. 3 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del. Philadelphia	4.502	4.502	4.502	4.228	3.356
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del., Philadelphia	4.13	4.13	4.13	3.918	2.968
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.71
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.95
Strip, H.R., Pitts.	3.975-4.225	3.975-4.225	3.975-4.225	3.75-4.00	2.80
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.55
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.71
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.85-5.10	3.775
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	4.70
Tin plate box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.70

SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$56.50
Wire rods, ⅜-⅝", Pitts.	4.425	4.425	4.425	4.10-30	3.175

PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$40.00
Basic Valley	54.50	54.50	54.50	52.00	39.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	42.004
No. 2 Fdry., Pitts.	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry., Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry., Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry., del. Phila.	59.75	59.75	59.75	57.11	42.504
No. 2 Fdry., Birm.	51.38	51.38	51.38	48.88	37.88
No. 2 Fdry (Birm.) del. Cin.	58.93	58.93	58.93	55.49	40.74
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	55.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*

*F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt, Pitts.	$44.00	$44.00	$44.00	$44.00	$40.50
No. 1 Heavy Melt, E. Pa.	41.50	41.50	41.50	42.50	42.00
No. 1 Heavy Melt, Chicago	42.50	42.50	42.50	42.50	39.25
No. 1 Heavy Melt, Valley	44.00	44.00	44.00	44.00	40.25
No. 1 Heavy Melt, Cleve.	43.00	43.00	43.00	43.00	39.75
No. 1 Heavy Melt, Buffalo	43.00	43.00	43.00	43.00	43.50
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	54.75
No. 1 Cast, Chicago	43.00	43.00	43.00	43.00	46.00

†F.o.b. shipping point.

COKE, Net Ton					
Beehive, Furn. Connlsvl.	$14.75	$14.75	$14.75	$14.75	$12.00-13.00
Beehive, Fdry. Connlsvl.	17.00	17.00	17.00	17.50	14.00-15.50
Oven Fdry., Chicago	24.50	24.50	24.50	23.00	18.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.	....	60.78	61.28	....
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity, Ala. R2	50.88	51.38	....	....
Birmingham R2	50.88	51.38	....	....
Birmingham S8	....	51.38	....	....
Woodward,Ala. W15	50.88	51.38	....	....
Cincinnati, del.	....	58.93	....	....
Buffalo District				
Buffalo R2	54.50	55.00	55.50	....
Buffalo H1	54.50	55.00	55.50	....
Tonawanda,N.Y. W12	54.50	55.00	55.50	....
No.Tonawanda,N.Y. T9	....	55.00	55.50	....
Boston, del.	65.15	66.65	66.15	....
Rochester,N.Y. del.	57.52	58.02	58.52	....
Syracuse,N.Y. del.	58.62	59.12	59.62	....
Chicago District				
Chicago I-R	54.50	55.00	55.00	55.50
Gary,Ind. U5	54.50	....	55.00	....
IndianaHarbor,Ind. I-2	54.50	....	55.00	....
So.Chicago,Ill. W14	54.50	55.00	55.00	....
So.Chicago,Ill. Y1	54.50	55.00	55.00	....
So.Chicago,Ill. U5	54.50	....	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon,Mich., del.	....	61.30	61.30	....
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	....
Akron,O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain,O. N3	54.50	....	....	55.50
Duluth I-3	....	....	55.00	....
Erie,Pa. I-3	54.50	55.00	55.00	55.50
Everett,Mass. E1	....	59.50	60.00	....
Fontana,Calif. K1	60.50	61.00	....	....
GraniteCity,Ill. G4	56.40	56.90	57.40	....
St.Louis, del. (inc. tax)	57.15	57.65	58.15	....
Ironton,Utah C11	54.50	55.00	....	....
Geneva,Utah C11	54.50	55.00	....	....
LoneStar,Tex. L6	50.50	*51.00	51.00	....
Minnequa,Colo. C10	56.50	57.50	57.50	....
Rockwood,Tenn. T3	....	....	58.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge				
Aliquippa, del.	....	56.37	56.37	56.87
McKeesRocks, del.	....	56.04	56.04	56.54
Lawrenceville, Homestead,				
Wilmerding, Monaca, del.	....	56.66	56.66	57.16
Verona, Trafford, del.	....	57.19	57.19	57.69
Brackenridge, del.	....	57.45	57.45	57.95
Bessemer,Pa. U5	54.50	....	55.00	55.50
Clairton,Rankin,So.Duquesne,Pa. U5	54.50	....	....	....
McKeesport,Pa. N3	54.50	....	....	55.50
Monessen,Pa. P7	56.50	....	....	....
Sharpsville,Pa. S6	....	....	55.00	55.50
Steelton,Pa. B2	56.50	57.00	57.50	58.00
Swedeland,Pa. A3	58.50	59.00	59.50	60.00
Toledo,O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	....	....
Troy,N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard,O. Y1	54.50	55.00	55.00	....
Youngstown Y1	54.50	55.00	55.00	....
Youngstown U5	54.50	....	....	55.50
Mansfield,O., del.	59.15	59.65	59.65	60.15

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton (Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)	
Jackson,O. G2, J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton	
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)	
NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry. frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton (Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)	
Lyles,Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton	
Cleveland, Intermediate, A7	$59.50
Steelton,Pa. B2	62.50
Philadelphia, delivered	66.05
Troy,N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Feb. 5, 1953 cents per pound except as otherwise noted. Changes shown in italics
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$81.00
Munhall,Pa. U5 .....54.00
Seattle S24 .....75.00

INGOTS, Alloy (NT)
Detroit R7 .....$57.00
Fontana,Calif. K1 ....83.00
Houston S5 .....65.00
Midland,Pa. C18 .....57.00
Munhall,Pa. U5 .....57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$59.00
Clairton,Pa. U5 .....59.00
Ensley,Ala T2 .....59.00
Fairfield,Ala. T2 .....59.00
Fontana,Calif. K1 ....78.00
Gary,Ind. U5 .....59.00
Johnstown,Pa. B2 ....59.00
Lackawanna,N.Y. B2 ..59.00
Munhall,Pa. U5 .....59.00
So.Chicago,Ill. U5 ....59.00
So.Duquesne,Pa. U5 ..59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$70.50
Buffalo R2 .....70.50
Canton,O. R2 .....70.50
Clairton,Pa. U5 .....70.50
Cleveland R2 .....70.50
Conshohocken,Pa. A3 ..77.50
Detroit R7 .....73.50
Ensley,Ala. T2 .....70.50
Fairfield,Ala. T2 .....70.50
Fontana,Calif. K1 ....89.50
Gary,Ind. U5 .....70.50
Geneva,Utah C11 .....70.50
Houston S5 .....78.50
Johnstown,Pa. B2 ....70.50
Lackawanna,N.Y. B2 ..70.50
LosAngeles B3 .....89.50
Munhall,Pa. U5 .....70.50
Seattle B3 .....89.50
So.Chicago R2,U5,W14 70.50
So.Duquesne,Pa. U5 ..70.50
So.SanFrancisco B3 ..89.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$76.00
Buffalo R2 .....76.00
Canton, O. R2 .....76.00
Canton,O. T7 .....78.60
Conshohocken,Pa. A3 ..83.00
Detroit R7 .....79.00
Fontana,Calif. K1 ....95.00
Gary,Ind. U5 .....76.00
Houston S5 .....84.00
Ind.Harbor,Ind. Y1 ....76.00
Johnstown,Pa. B2 ....76.00
Lackawanna,N.Y. B2 ..76.00
LosAngeles B3 .....96.00
Massillon,O. R2 .....76.00
Midland,Pa. C18 .....76.00
Munhall,Pa. U5 .....76.00
So.Chicago R2,U5,W14 76.00
So.Duquesne,Pa. U5 ..76.00
Struthers,O. Y1 .....76.00
Warren,O. C17 .....76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$87.50
Canton,O. R2 .....87.50
Cleveland R2 .....87.50
Fontana,Calif. K1 ....108.50
Gary,Ind. U5 .....87.50
Massillon,O. R2 .....87.50
So.Chicago,Ill. R2 ....87.50
So.Duquesne,Pa. U5 ..87.50

SHEET BARS (NT)
Fontana,Calif. K1 ....$68.18

SKELP
Aliquippa,Pa. J5 .....$3.65
Munhall,Pa. U5 .....3.55
Warren,O. R2 .....3.55
Youngstown R2, U5 ....3.55

WIRE RODS
Alton,Ill L1 .....4.70
AlabamaCity,Ala. R2 ..4.325
Buffalo W12 .....4.325
Cleveland A7 .....4.325
Donora,Pa. A7 .....4.325
Fairfield,Ala. T2 .....4.325
Fontana,Calif. K1 ....5.125
Houston S5 .....4.725
Johnstown,Pa. B2 ....4.325
Joliet,Ill. A7 .....4.325
KansasCity,Mo. S5 ....4.675
LosAngeles B3 .....5.125
Minnequa,Colo. C10 ...4.575
Monessen,Pa. P7 .....4.525
No.Tonawanda,N.Y.B11 4.325
Pittsburg,Calif. C11 ..4.975
Portsmouth,O. P12 ....4.525
Roebling,N.J. R3 .....4.425
So.Chicago,Ill. R2 ....4.325
SparrowsPoint,Md. B2..4.425
Sterling,Ill.(1) N15 ....4.325
Struthers,O. Y1 .....4.325
Torrance,Calif. C11 ....5.125
Worcester,Mass. A7 ....4.625

SHEET STEEL PILING
Ind Harbor, Ind. I-2..4.675
Lackawanna,N.Y. B2 ..4.675
Munhall,Pa. U5 .....4.675
So.Chicago,Ill. U5 ....4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.85
Aliquippa,Pa. J5 .....3.85
Bessemer,Ala. T2 .....3.85
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fairfield,Ala. T2 .....3.85
Fontana,Calif. K1 .....4.50
Gary,Ind. U5 .....3.85
Geneva,Utah C11 .....3.85
Houston S5 .....4.25
Ind.Harbor,Ind. I-2 ....3.85
Johnstown,Pa. B2 .....3.90
KansasCity,Mo. S5 ....4.45
Lackawanna,N.Y. B2 ..3.90
LosAngeles B3 .....4.45
Minnequa,Colo. C10 ...4.30
Munhall,Pa. U5 .....3.85
Niles,Calif.(22) P1 ....4.56
Phoenixville,Pa. P4 ....6.10
Seattle B3 .....4.50
So.Chicago,Ill. U5 W14 3.85
So.SanFrancisco B3 ....4.40
Torrance,Calif. C11 ....4.45
Weirton,W.Va. W6 ....4.10

Wide Flange
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fontana,Calif. K1 .....4.65
Johnstown,Pa. B2 .....3.90
Lackawanna,N.Y. B2 ..3.90
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 .....3.85

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.725
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....4.725
Munhall,Pa. U5 .....4.725
So.Chicago,Ill. U5 ....4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.80
Bessemer,Ala. T2 .....5.80
Bethlehem,Pa. B2 .....5.80
Clairton,Pa. U5 .....5.80
Fairfield,Ala. T2 .....5.80
Fontana,Calif. K1 .....6.45
Gary,Ind. U5 .....5.80
Geneva,Utah C11 .....5.80
Ind.Harbor,Ind. I-2 ....5.80
Ind.Harbor,Ind. Y1 .....6.30
Johnstown,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
LosAngeles B3 .....6.35
Munhall,Pa. U5 .....5.80
Seattle B3 .....6.40
So.Chicago,Ill. U5 ....5.80
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.30

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 .....5.50
Bethlehem,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
Munhall,Pa. U5 .....5.75
So.Chicago,Ill. U5 ....5.75

BEARING PILES
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 ....3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.95
Bessemer,Ala. T2 .....5.95
Clairton,Pa. U5 .....5.95
Cleveland J5, R2 .....5.95
Conshohocken,Pa. A3 ...6.20
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....5.95
Fontana,Calif.(30) K1 ...6.65
Gary,Ind. U5 .....5.95
Geneva, Utah C11 .....5.95
Ind Harbor,Ind. I-2 ....5.95
Ind Harbor,Ind. Y1 ....6.45
Johnstown,Pa. B2 .....5.95
Munhall,Pa. U5 .....5.95
Pittsburgh J5 .....5.95
Seattle B3 .....6.85
Sharon,Pa. S3 .....5.95
So. Chicago,Ill. U5 ....5.95
SparrowsPoint,Md. B2 ..5.95
Warren,O. R2 .....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....5.35
Coatesville,Pa. L7 .....5.75
Conshohocken,Pa. A3 ....5.55
Fontana,Calif. K1 .....6.20
Gary,Ind. U5 .....5.25
Johnstown,Pa. B2 .....5.25
Munhall,Pa. U5 .....5.25
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.25
SparrowsPoint,Md. B2 ..5.25

FLOOR PLATES
Cleveland J5 .....4.95
Conshohocken,Pa. A3 ...4.95
Ind Harbor,Ind. I-2 ....4.95
Munhall,Pa. U5 .....4.95
So.Chicago,Ill. U5 ....4.95

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ...4.15
Cleveland,c.l. R2 .....4.50
Warren,O., c.l. R2 ....4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.90
Aliquippa,Pa. J5 .....3.90
Ashland,Ky. (15) A10...3.90
Bessemer,Ala. T2 .....3.90
Clairton,Pa. U5 .....3.90
Claymont,Del. C22 ....4.35
Cleveland J5, R2 .....3.90
Coatesville,Pa. L7 ....4.35
Conshohocken,Pa. A3 ..4.35
Ecorse,Mich. G5 .....4.45
Fairfield,Ala. T2 .....3.90
Fontana,Calif.(30) K1 ...4.55
Gary,Ind. U5 .....3.90
GraniteCity,Ill. G4 ....4.60
Geneva,Utah C11 .....3.90
Harrisburg,Pa. C5 ....6.50
Houston S5 .....4.30
Ind Harbor,Ind. I-2, Y1 3.90
Johnstown,Pa. B2 .....3.90
Lackawanna,N.Y. B2 ..3.90
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....3.90
Pittsburgh J5 .....3.90
Seattle B3 .....4.80
Sharon,Pa. S3 .....4.15
So.Chicago,Ill. U5, W14 3.90
SparrowsPoint,Md. B2 ..3.90
Steubenville,O. W10 ....3.90
Warren,O. R2 .....3.90
Weirton,W.Va. W6 ....4.20
Youngstown R2, U5, Y1 3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.70
Geneva,Utah C11 .....5.05

PLATES, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.95
Aliquippa,Pa. J5 .....3.95
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2 .....3.95
Clairton,Pa. U5 .....3.95
Cleveland R2 .....3.95
Detroit R7 .....4.10
Ecorse,Mich. G5 .....4.30
Emeryville,Calif. J7 ....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 .....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.35
Ind Harbor,Ind. I-2 Y1. 3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..3.95
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.40
Niles,Calif. P1 .....4.65
N.Tonawanda,N.Y. B11 3.95
Pittsburg,Calif. C11 ....4.65
Pittsburgh J5 .....3.95
Seattle B3, N14 .....4.70
So.Chicago R2,U5,W14 ..3.95
So.Duquesne,Pa. U5 ....3.95
So.SanFran.,Calif. B3 ....4.70
Sterling,Ill. N15 .....4.55
Struthers,O. Y1 .....3.95
Torrance,Calif. C11 ....4.65
Weirton,W.Va. W6 .....4.10
Youngstown R2, U5 ....3.95

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.95
Atlanta A11 .....4.50
Niles,Calif. P1 .....4.65
SanFrancisco S7 .....5.00

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.675
Buffalo R2 .....4.675
Canton,O. R2 .....4.675
Canton,O. T7 .....4.72
Clairton,Pa. U5 .....4.675
Detroit R7 .....4.825
Ecorse,Mich. G5 .....5.025
Fontana,Calif. K1 ....5.725
Gary,Ind. U5 .....4.675
Houston S5 .....5.075
Ind.Harbor,Ind. I-2,Y1 4.675
Johnstown,Pa. B2 .....4.675
KansasCity,Mo. S5 ....5.275
Lackawanna,N.Y. B2 ..4.675
LosAngeles B3 .....5.725
Massillon,O. R2 .....4.675
Midland,Pa. C18 .....4.675
So.Chicago R2,U5,W14 4.675
So.Duquesne,Pa. U5 ....4.675
Struthers,O. Y1 .....4.675
Warren,O. C17 .....4.675
Youngstown U5 .....4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.925
Gary,Ind. U5 .....4.925
Youngstown U5 .....4.925

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.925
Bessemer,Ala T2 .....5.925
Bethlehem,Pa. B2 .....5.925
Clairton,Pa. U5 .....5.925
Cleveland R2 .....5.925
Ecorse,Mich. G5 .....6.675
Fairfield,Ala T2 .....5.925
Fontana,Calif. K1 ....6.975
Gary,Ind. U5 .....5.925
Ind.Harbor,Ind. I-2 ....5.925
IndianaHarbor,Ind. Y1 6.425
Johnstown,Pa. B2 .....5.925
Lackawanna,N.Y. B2 ..5.925
LosAngeles B3 .....6.625
Pittsburgh J5 .....5.925
Seattle B3 .....6.675
So.Duquesne,Pa. U5 ....5.925
So.SanFrancisco B3 ....6.675
Struthers,O. Y1 .....6.425
Youngstown U5 .....5.925

BARS, Cold-Finished Carbon
Ambridge,Pa W18 ....4.925
BeaverFalls,Pa. R2 ....4.925
BeaverFalls,Pa. M12 ..4.925
Buffalo B5 .....4.975
Camden,N.J. P13 .....5.375
Carnegie,Pa. C12 .....4.925
Chicago B5 .....4.925
Chicago W18 .....4.925
Cleveland A7, C20 .....4.925
Detroit P17, R7 .....5.075
Donora,Pa. A7 .....4.925
Elyria,O. W8 .....4.925
FranklinPark,Ill. N5 ..4.925
Gary,Ind. R2 .....4.925
GreenBay, Wis. F7 .....4.925
Hammond,Ind. L2, M13 .4.925
Hartford,Conn. R2 .....5.475
LosAngeles R2 .....6.375
Mansfield,Mass. B5 .....5.475
Massillon,O. R2, R8 ....4.925
Monaca,Pa. S17 .....4.925
Newark,N.J. W18 .....5.375
Plymouth,Mich. P6 .....5.175
Pittsburgh J5 .....4.925
Putnam,Conn. W18 .....5.475
Readville,Mass. C14 ....5.475
St. Louis,Mo. M5 .....5.30
So.Chicago,Ill. W14 ....4.925
SpringCity,Pa. K3 .....5.375
Struthers,O. Y1 .....4.925
Waukegan,Ill. A7 .....4.925
Youngstown Y1 .....4.925
Youngstown F3 .....4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....6.00
BeaverFalls,Pa. M12 ....6.00
Bethlehem,Pa. B2 .....6.00
Buffalo B5 .....6.00
Camden,N.J. P13 .....6.40
Canton,O. R2 .....6.00
Canton,O. T7 .....5.99
Carnegie,Pa. C12 .....6.00
Chicago B5 .....6.00
Chicago W18 .....6.00
Cleveland A7 .....6.05
Cleveland C20 .....6.00
Detroit P17, R7 .....6.15
Donora,Pa. A7 .....6.05
Elyria,O. W8 .....6.00
Gary,Ind. R2 .....6.00
Hammond,Ind. L2, M13 6.00
Hartford,Conn. R2 .....6.45
Lackawanna,N.Y. B2 ....6.00
Mansfield,Mass. B5 .....6.45
Massillon,O. R2, R8 ....6.00
Midland,Pa. C18 .....6.00
Monaca,Pa. S17 .....6.00
Newark,N.J. W18 .....6.35
Plymouth,Mich. P5 .....6.20
So.Chicago,Ill. R2, W14 6.00
SpringCity,Pa. K3 .....6.20
Struthers,O. Y1 .....6.00
Warren,O. C17 .....6.00
Waukegan,Ill. A7 .....6.05
Worcester,Mass. A7 .....6.35
Youngstown Y1 .....6.00
Youngstown F3 .....6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ....3.95
Atlanta A11 .....4.50
Buffalo R2 .....3.95
Cleveland R2 .....3.95
Emeryville,Calif. J7 ....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 .....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.35
Ind Harbor,Ind. I-2, Y1 3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..3.95
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.65
Pittsburg,Calif. C11 ....4.65
Pittsburgh J5 .....3.95
SandSprings, Okla. S5 ...4.85
Seattle B3, N14 .....4.70
So.Chicago,Ill. R2 .....3.95
So.Duquesne,Pa. U5 ....3.95
So.SanFrancisco B3 ....4.70
SparrowsPoint,Md. B2 ..3.95
Sterling,Ill.(1) N15 ....4.70
Struthers,O. Y1 .....3.95
Torrance,Calif. C11 ....4.65
Youngstown R2, U5 ....3.95

BARS, Reinforcing (Fabricated; to consumers)
Huntington,W.Va. W7 ...5.50
Johnstown, ¾-1" B2 .....5.25
LosAngeles B3 .....5.45
Marion,O. P11 .....5.25
Seattle B3, N14 .....5.80
So.SanFrancisco B3 ....5.45
SparrowsPt. ¾-1" B2 ...5.25
Williamsport,Pa. S19 ...5.35

RAIL STEEL BARS
Chicagoflts.(34) C2 .....4.75
Chicagoflts.(34) I-2 .....4.75
Franklin Pa.(34) F5 .....4.75
FortWorth,Tex.(26) T4 ..5.19
Huntngt,W.Va.(34) W7 ...5.75
Marion,O.(34) P11 .....4.75
Moline,Ill.(34) R2 .....4.05
Tonawanda(3,4) B12 ....5.00
Williamsport(3) S19 ....5.25
Williamsport(4) S19 ....5.35

BARS, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa.(S.R.) B14 9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt)B14 12.20
McK Rks.(Staybolt)I-5. 14.50
McK Rks.(S.R.) I-5 ....9.60
McK Rks.(D.R.) I-5 ....13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ...3.775
Ashland,Ky.(8) A10 ....3.775
Butler,Pa. A10 .....3.775
Cleveland J5, R2 .....3.775
Conshohocken,Pa. A3 ...4.175
Detroit M1 .....4.40
Ecorse,Mich. G5 .....3.975
Fairfield,Ala. T2 .....3.775
Fontana,Calif. K1 .....4.825
Gary,Ind. U5 .....3.775
Geneva,Utah C11 .....3.875
GraniteCity,Ill. G4 ....4.30
Ind Harbor,Ind. I-2, Y1 3.775
Irvin,Pa. U5 .....3.775
Lackawanna,N.Y. B2 ...3.775
Munhall,Pa. U5 .....3.775
Niles,O. N12 .....5.425
Pittsburg,Calif. C11 ....4.475
Pittsburgh J5 .....3.775
Sharon,Pa. S3 .....4.175
So.Chicago,Ill. W14 ....3.775
SparrowsPoint,Md. B2..3.775
Steubenville,O. W10 ...3.775
Torrance,Calif. C11 ....4.475
Warren,O. R2 .....3.775
Weirton,W.Va. W6 .....3.775
WestLeechburg,Pa. A4 3.925
Youngstown U5, Y1 ....3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ...4.925
Dover,O. R1 .....5.825
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.675
Torrance,Calif. C11 ....5.575

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.675
Conshohocken,Pa. A3 ...5.925
Ecorse,Mich. G5 .....6.225
Fairfield,Ala. T2 .....5.675
Fontana,Calif. K1 .....6.775
Gary,Ind. U5 .....5.675
Ind Harbor,Ind. I-2 ....5.675
Ind Harbor,Ind. Y1 .....6.175
Irvin,Pa. U5 .....5.675
Lackawanna(35) B2 ....5.675
Munhall U5 .....5.675
Pittsburgh J5 .....5.675
Sharon,Pa. S3 .....5.675
So.Chicago,Ill. U5 .....5.675
SparrowsPoint(36) B2..5.675
Warren,O. R2 .....5.675
Weirton,W.Va. W6 .....6.025
Youngstown U5 .....5.675
Youngstown Y1 .....6.175

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.925
Ecorse,Mich. G5 .....7.475
Fontana,Calif. K1 .....7.875
Gary,Ind. U5 .....6.925
IndianaHarbor,Ind. Y1 7.425
IndianaHarbor,Ind. I-2 6.925
Irvin,Pa. U5 .....6.925
Lackawanna(37) B2 ....6.925
Pittsburgh J5 .....6.925
SparrowsPoint(38) B2..6.925
Warren,O. R2 .....6.925
Weirton,W.Va. W6 .....7.275
Youngstown Y1 .....7.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.575
Cleveland J5, R2	4.575
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.575
Follansbee,W.Va. F4	4.575
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.575
GraniteCity,Ill. G4	5.275
Ind Harbor,Ind. I-2,Y1	4.575
Irvin,Pa. U5	4.575
Lackawanna,N.Y. B2	4.575
Middletown,O. A10	4.575
Pittsburg,Calif. C11	5.525
Pittsburgh J5	4.575
SparrowsPoint,Md. B2	4.575
Steubenville,O. W10	4.575
Warren,O. R2	4.575
Weirton,W.Va. W6	4.575
WestLeechburg,Pa. A4	5.45
Youngstown Y1	4.575

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	5.075
Ashland,Ky.(8) A10	5.075
Canton,O. R2	5.075
Delphos,O. N16	5.675
Dover,O. R1	5.775
Fairfield,Ala. T2	5.075
Gary,Ind. U5	5.075
GraniteCity,Ill. G4	5.50
Ind Harbor,Ind. I-2	5.075
Irvin,Pa. U5	5.075
Kokomo,Ind.(13) C16	5.475
MartinsFerry,O. W10	5.075
Niles,O. N12	6.275
Pittsburg,Calif. C11	5.825
SparrowsPoint,Md. B2	5.075
Steubenville,O. W10	5.075
Torrance,Calif. C11	5.825
Weirton,W.Va. W6	5.075

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.625
SparrowsPoint(39) B2	7.775

SHEETS, Galvannealed Steel

Canton,O. R2	5.625
Irvin,Pa. U5	5.625
Kokomo,Ind.(13) C16	6.025
Niles,O. N12	6.825

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.325
Middletown,O. A10	5.325

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.925
Niles,O. R2 (28)	5.925
Weirton,W.Va. W6	5.775

SHEETS, Well Casing

Fontana,Calif. K1	5.34

BLUED Stock, 29 ga.

Yorkville,O. W10	7.00
Follansbee,W.Va. F4	7.10
Follansbee (23) F4	6.425

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.925
Cleveland R2	4.925
Gary,Ind. U5	4.925
GraniteCity,Ill. G4	5.625
Ind Harbor,Ind. I-2	4.925
Irvin,Pa. U5	4.925
Middletown,O. A10	4.925
Youngstown Y1	4.925

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R (22 Ga.) COILS (Cut lengths ½c lower)

	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	7.85	9.10	9.90
Brackenridge,Pa. A4	...	...	8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	7.55	7.85	(34)	(41)	...
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.05	7.35	7.85	...	...
Vandergrift,Pa. U5	...	...	7.85	8.35	9.60 10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10	...	7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Length 1½c lower)

Transformer Grade	72	65	58	52
Beechbottom W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95	...	...	...
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	...	...	...
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.10
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.35

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.875	...
Canton,O. R2	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5	5.875	6.125
Ind.Harbor I-2	5.875	6.125
Irvin,Pa. U5	5.875	6.125
Kokomo,Ind. C16	6.525	...
MartinsFy.,O. W10	5.875	...
Pittsburg,Cal C11	6.625	...
SparrowsPt, B2	5.875	...
Torrance,Cal.C11	6.625	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	6.125
Fairfield,Ala. T2	6.125
MartinsFerry,O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	4.025
Cleveland R2	4.375
Ind.Harbor,Ind. I-2	4.025
Warren,O. R2	4.375

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10	5.075
Cleveland R2	5.175
Middletown,O. A10	5.075
Warren,O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.325
Canton,O. R2	5.825

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	8.425

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	...
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.05
Middletown,O. A10	5.475
Niles,O. N12	6.275
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.875

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.65
Conshohocken,Pa. A3	5.90
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.65
Fontana,Calif. K1	6.55
Gary,Ind. U5	5.65
Ind.Harb.,Ind. I-2	5.65
Ind.Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	5.70
LosAngeles(25) B3	6.40
Seattle(25) B3	6.65
Sharon,Pa. S3	5.65
So.SanFrancisco(25) B3	6.40
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown Y1	6.15
Youngstown U5	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	7.45
Cleveland A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	8.15
Lackawanna,N.Y. B2	7.90
Sharon,Pa. S3	7.30
SparrowsPoint,Md. B2	7.90
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown Y1	7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.725
Alton,Ill. L1	4.20
Ashland,Ky.(8) A10	3.725
Atlanta A11	4.275
Bessemer,Ala. T2	3.725
Bridgeport,Conn.(10)S15	4.225
Buffalo(27) R2	3.725
Butler,Pa. A10	3.725
Carnegie,Pa. S18	4.225
Conshohocken,Pa. A3	4.125
Detroit M1	4.40
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	5.175
Gary,Ind. U5	3.725
Houston,Tex. S5	4.125
Ind Harbor,Ind. I-2,Y1	3.725
Johnstown,Pa.(25) B2	3.725
KansasCity,Mo.(9) S5	4.325
Lackawna,N.Y.(32) B2	3.725
LosAngeles(25) B3	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.775
New Britain(10) S15	4.225
N.Tonawanda,N.Y. B11	3.725
Pittsburg,Calif. C11	4.475
Riverdale,Ill. A1	3.725
SanFrancisco S7	5.00
Seattle(25) B3	4.725
Seattle N14	4.75
Sharon,Pa. S3	4.225
So.Chicago,Ill. W14	3.725
So.SanFrancisco(25) B3	4.475
SparrowsPoint,Md. B2	3.725
Sterling,Ill. N15	4.725
Torrance,Calif. C11	4.475
Warren,O. R2	3.725
Weirton,W.Va. W6	3.825
WestLeechburg,Pa. A4	3.975
Youngstown U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	6.05
Carnegie,Pa. S18	6.45
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	6.50
KansasCity,Mo. S5	6.70
Midland,Pa. C18	5.85
NewBritn.,Conn.(10) S15	6.05
Sharon,Pa. S3	6.45
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Bridgeprt,Conn.(10) S15	5.80
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D3	6.05
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	5.30
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	6.75
FranklinPark,Ill.(40) T6	5.35
Ind.Harbor,Ind. I-2	5.35
Lackawanna,N.Y. B2	5.10
LosAngeles C1	6.85
Mattapan,Mass. T6	5.95
Middletown,O. A10	5.10
NewBritain(10) S15	5.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1	...	...	8.55	10.50	...
Carnegie,Pa. S18	...	7.65	8.25	10.20	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50	...	...
Detroit D2	6.45	7.50	8.10	...	...
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18	...	...	8.55	10.50	12.80
Mattapan,Mass. T6	5.55	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	...
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.70	7.60	8.20	...	...
NewYork W3	...	7.95	8.55	10.50	12.80
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	...	7.65	8.25	10.20	12.50
Worcester,Mass.,Base	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5	...	7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8	...	7.65	8.25	10.20	12.50
Spring Steel (Tempered)					
Trenton,N.J. R5 (29)	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30*	12.50*	15.35*
Youngstown C8	...	...	10.30	12.50	15.35

* Plus 1.575 per 100 lb.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Riverdale,Ill A1	4.30
Sharon,Pa. S3	4.55
Youngstown U5	4.15

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.70
Weirton,W.Va. W6	5.10
Youngstown C8	5.70

STRIP, Cold-Rolled Alloy Steel

Brdgeprt,Conn.(10)S15	12.15
Carnegie,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn,Conn.(10)S15	12.15
Pawtucket,R.I.(11) N8	12.15
Pawtucket,R.I.(12) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown, C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Riverdale,Ill A1	4.30
Sharon,Pa. S3	4.55
Youngstown U5	4.15

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.70
Weirton,W.Va. W6	5.10
Youngstown C8	5.70

STRIP, Cold-Rolled Alloy Steel

Brdgeprt,Conn.(10)S15	12.15
Carnegie,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn,Conn.(10)S15	12.15
Pawtucket,R.I.(11) N8	12.15
Pawtucket,R.I.(12) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown, C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Riverdale,Ill A1	4.30
Sharon,Pa. S3	4.55
Youngstown U5	4.15

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.70
Weirton,W.Va. W6	5.10
Youngstown C8	5.70

STRIP, Cold-Rolled Alloy Steel

Brdgeprt,Conn.(10)S15	12.15
Carnegie,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn,Conn.(10)S15	12.15
Pawtucket,R.I.(11) N8	12.15
Pawtucket,R.I.(12) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown, C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Riverdale,Ill A1	4.30
Sharon,Pa. S3	4.55
Youngstown U5	4.15

Key to Producers

A1	Acme Steel Co.
A3	Alan Wood Steel Co.
A4	Allegheny Ludlum Steel
A7	American Steel & Wire
A8	Anchor Drawn Steel Co.
A9	Angell Nail & Chaplet
A10	Armco Steel Corp.
A11	Atlantic Steel Co.
A13	American Cladmetals Co.
B1	Babcock & Wilcox Co.
B2	Bethlehem Steel Co.
B3	Beth. Pac. Coast Steel
B4	Blair Strip Steel Co.
B5	Bliss & Laughlin Inc.
B6	Bolardi Steel Corp.
B8	Braeburn Alloy Steel
B11	Buffalo Bolt Co.
B12	Buffalo Steel Div., H. K. Porter Co.
B14	A. M. Byers Co.
C1	Calstrip Steel Corp.
C2	Calumet Steel Div. Borg-Warner Corp.
C4	Carpenter Steel Co.
C5	Central Iron & Steel Div. Barium Steel Corp.
C7	Cleve. Cold Rolling Mills
C8	Cold Metal Products Co.
C9	Colonial Steel Co.
C10	Colorado Fuel & Iron
C11	Columbia-Geneva Steel
C12	Columbia Steel & Shaft
C13	Columbia Tool Steel Co.
C14	Compressed Steel Shaft
C16	Continental Steel Corp.
C17	Copperweld Steel Co.
C18	Crucible Steel Co.
C19	Cumberland Steel Co.
C20	Cuyahoga Steel & Wire
C22	Claymont Steel Products Dept., Wickwire Spencer Steel Division
D2	Detroit Steel Corp.
D3	Detroit Tube & Steel
D4	Disston & Sons, Henry
D6	Driver Harris Co.
D7	Dickson Weatherproof Nail Co.
E1	Eastern Gas&Fuel Assoc.
E2	Eastern Stainless Steel
E4	Electro Metallurgical Co.
E5	Elliott Bros. Steel Co.
E6	Empire Steel Corp.
F2	Firth Sterling Inc.
F3	Fitzsimons Steel Co.
F4	Follansbee Steel Corp.
F5	Franklin Steel Div. Borg-Warner Corp.
F6	Fretz-Moon Tube Co.
F7	Ft. Howard Steel & Wire
G2	Globe Iron Co.
G3	Globe Steel Tubes Co.
G4	Granite City Steel Co.
G5	Great Lakes Steel Corp.
G6	Greer Steel Co.
H1	Hanna Furnace Corp.
I-1	Igoe Bros. Inc.
I-2	Inland Steel Co.
I-3	Interlake Iron Corp.
I-4	Ingersoll Steel Div. Borg-Warner Corp.
I-7	Indiana Steel & Wire Co.
J1	Jackson Iron & Steel Co.
J4	Jessop Steel Co.
J4	Johnson Steel & Wire Co.
J5	Jones & Laughlin Steel
J6	Joslyn Mfg. & Supply
J7	Judson Steel Corp.
J8	Jersey Shore Steel Co.
K1	Kaiser Steel Corp.
K2	Keokuk Electro Metals
K3	Keystone Drawn Steel
K4	Keystone Steel & Wire
L1	Laclede Steel Co.
L2	LaSalle Steel Co.
L3	Latrobe Steel Co.
L5	Lockhart Iron & Steel
L6	Lone Star Steel Co.
L7	Lukens Steel Co.

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
AlabamaCity R2	6.075	6.325
Aliquippa J5	6.075	6.525†
Atlanta A11	6.325	6.675
Bartonville(19)K4	6.075	6.40
Buffalo W12	5.225	....
Cleveland A7	6.075	6.225
CrawfordsvilleMS	6.175	6.50
Donora,Pa. A7	6.075	6.225
Duluth,Minn. A7	6.075	6.225
Fairfield T2	6.075	6.225
Houston,Tex. S5	6.475	6.625
Johnstown B2	6.075	6.45†
Joliet,Ill. A7	6.075	6.225
KansasCy,Mo. S5	6.675	6.825
Kokomo C16	6.175	6.425
LosAngeles B3	7.025	....
Minnequa C10	6.325	6.70*
Monessen P7	6.075	6.45
Palmer W12	5.525	....
Pitts.,Calif. C11	7.025	7.175
Prismith.(18)P12	6.475	....
Rankin A7	6.075	6.225
So.Chicago R2	6.075	6.325
So.S.Fran. C10	7.925	7.40*
SparrowsPt. B2	6.175	6.55†
Sterling,Ill.(1)N15	6.075	6.4o
Struthers,O. Y1	6.075	6.475
Torrance,Cal. C11	7.025	....
Worcester A7	6.375	6.525

*Based on 14c zinc; †14.50c zinc; ‡17.5c zinc.

WIRE (16 gage) Stone

Stone (Add 4.7% on base and extras)	Anl'd.	Galv.
Aliquippa J5	10.15	12.15
Bartonville(19)K4	10.25	12.00*
Cleveland A7	10.25	11.65
Crawfrdsville MS	10.73	12.51
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.73	12.58‡
Kokomo C16	10.625†	12.325‡
Minnequa C10	10.40	12.425*
Palmer,Mass. W12	10.25	12.15
Pitts.,Cal. C11	10.60	11.90
SparrowsPt. B2	10.84	12.68‡
Sterling(1) N15	10.73‡	12.20
Waukegan A7	10.25	11.55
Worcester A7	....	11.85

*Based on 14c zinc; ‡14.60c zinc. †Includes 4.7% increase.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.225
Aliquippa,Pa. J5 (42)	4.85
Atlanta A11	5.475
Alton,Ill. L1	5.45
Bartonville,Ill. K4	5.325
Buffalo W12	5.225
Chicago W13	5.475
Cleveland A7, C20	5.225
Crawfordsville,Ind. MS	5.325
Donora,Pa. A7	5.225
Duluth,Minn. A7	5.225
Fairfield,Ala. T2	5.225
Fostoria,O. (24) S1	5.725
Houston S5	5.625
Johnstown,Pa. B2	5.225
Joliet,Ill. A7	5.225
KansasCity,Mo. S5	5.825
Kokomo,Ind. C16	5.325
LosAngeles B3	6.175
M.nnequa,Colo. C10	5.475
Monessen,Pa. P7	5.475
Newark 6-8 ga I-1	5.88
No.Tonawanda B11	5.225
Palmer,Mass. W12	5.525
Pittsburg,Calif. C11	6.175
Portsmouth,O. P12	5.625
Rankin,Pa. A7	5.225
So.Chicago,Ill. R2	5.225
So.SanFrancisco C10	6.175
SparrowsPoint,Md. B2	5.325
Sterling,Ill. (1) N15	5.225
Struthers,O. Y1	5.225
Torrance,Calif. C11	5.525
Waukegan,Ill. A7	5.225
Worcester,Mass. A7	5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12 (43)	6.35
Cleveland A7 (43)	5.85
Crawf'sville,Ind.MS(43)	5.85
Dover,O. G6	6.20
Fostoria,O. S1 (43)	6.00
Kokomo,Ind. C16 (43)	5.70
FranklinPark,Ill. T6(43)	6.20
Massillon,O. R8 (43)	5.85
Monessen,Pa. P16 (43)	6.35
Monessen,Pa. P7 (43)	6.10
Pawtkt,R.I.(12) N8 (43)	6.85
Trenton,N.J. R5 (43)	6.15
Worcester,Mass.A7 (43)	6.15
Worcester,Mass.T6 (43)	6.50
Worcester,Mass.W12(43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.90
Monessen,Pa. P16 (43)	8.50
Muncie,Ind. I-7 (43)	8.70
Roebling,N.J. R5 (43)	8.80
SparrowsPt.,Md. B2(43)	8.60
Johnstown,Pa. B2 (43)	8.50

ROPE WIRE

Alton,Ill. L1 (43)	8.75
Bartonville,Ill. K4	8.95
Buffalo W12 (43)	8.55
Fostoria,O. S1 (43)	8.85
Johnstown,Pa. B2 (43)	8.55
Monessen,Pa. P16 (43)	8.55
Monessen,Pa. P7 (43)	8.80
Muncie,Ind. I-7 (43)	8.75
Palmer,Mass. W12 (43)	8.85
Portsmouth,O. P12 (43)	8.55
Roebling,N.J. R5 (43)	8.85
SparrowsPt. B2 (43)	8.65
Struthers,O. Y1 (43)	8.55
Worcester,Ja. T6 (43)	8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 (43)	6.25
Alton,Ill. L1 (43)	6.55
Bartonville,Ill. K4	6.64
Buffalo W12 (43)	6.25
Cleveland A7 (43)	6.25
Donora,Pa. A7 (43)	6.25
Duluth,Minn. A7 (43)	6.25
Fostoria,O. S1 (43)	6.25
Johnstown,Pa. B2 (43)	6.25
Millbury(12) N6 (43)	8.05
Minnequa,Colo. C10(43)	6.50
Monessen,Pa. P7 (43)	6.25
Monessen,Pa. P16	6.75
Muncie,Ind. I-7 (43)	6.45
Palmer,Mass. W12(43)	6.55
Pittsburg,Calif. C11(43)	7.20
Roebling,N.J. R5 (43)	6.55
Portsmouth,O. P12(43)	6.25
So.Chicago,Ill. R2 (43)	6.25
So.SanFran. C10 (43)	7.20
SparrowsPt.,Md. B2 (43)	6.35
Struthers,O. Y1 (43)	6.25
Trenton,N.J. A7 (43)	6.55
Waukegan,Ill. A7 (43)	6.25
Worcester,A7, T6 (43)	6.55
Worcester,Mass. J4 (43)	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.275
Alton,Ill. L1	6.50
Buffalo W12	6.275
Cleveland A7	6.275
Donora,Pa. A7	6.275
Duluth,Minn. A7	6.275
Johnstown,Pa. B2	6.275
LosAngeles B3	7.225
Minnequa,Colo. C10	6.525
Monessen,Pa. P7	6.275
Monessen,Pa. P16(42)	6.40
NewHaven,Conn. A7	6.575
Palmer,Mass. W12	6.575
Pittsburg,Calif. C11	7.225
Portsmouth,O. P12	6.275
Roebling,N.J. R5	6.575
So.Chicago,Ill. R2	6.275
So.SanFrancisco C10	7.225
SparrowsPoint,Md. B2	6.375
Torrance,Calif. C11	7.225
Trenton,N.J. A7	6.575
Waukegan,Ill. A7	6.275
Worcester,Mass. A7	6.575

WIRE, Fine & Weaving (8" Coils)

Alton,Ill.L1 (43)	9.20
Bartonville,Ill. K4	9.42
Buffalo W12 (43)	8.90
Chicago W13	9.32
Cleveland A7 (43)	8.90
Crawf'sville,Ind. MS(43)	8.90
Fostoria,O. S1 (43)	8.90
Johnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16 (43)	8.90
Monessen,Pa. P16 (43)	8.90
Muncie,Ind. I-7 (43)	9.10
Palmer,Mass. W12 (43)	9.20
Roebling,N.J. R5 (43)	8.90
Waukegan,Ill. A7 (43)	8.90
Worcstr,Mass. A7,T6(43)	9.20

WIRE, Tire Bead

Bartonville,Ill. K4	11.51
Monessen,Pa. P16 (43)	11.40
Roebling,N.J. R5 (43)	11.55

WOVEN FENCE,9-15½ Ga. Col.

AlabamaCity,Ala. R2	135
Ala.City,Ala.,17-18ga.R2	222
Allqu'pa,Pa.9-14½ga.J5	1391
Atlanta A11	140
Bartonville,Ill.(19) K4	137
Crawfordsville,Ind. MS	139
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Houston,Tex. S5	141
Johnstown,Pa. B2	138
Johnstown,17ga.,6" B2	229
Joliet,Ill. A7	133
KansasCity,Mo. S5	145
Kokomo,Ind. C16	140
Minnequa,Colo. C10	146*
Monessen,Pa. P7	138
Pittsburg,Calif. C11	156
Rankin,Pa. A7	133
So.Chicago,Ill. R2	135
Sterling,Ill. (1) N15	137

*Based on 14c zinc; ‡17.5c zinc.

FENCE POSTS

	Col.
Chicagolfts.,Ill. C2	140
Duluth,Minn. A7	133
Franklin,Pa. F5	145
Huntington,W.Va. W7	148
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	144
Aliquippa,Pa. J5	148‡
Atlanta A11	149
Bartonvill,Ill.(19) K4	146
Crawfordsville,Ind. MS	148
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	150
Johnstown,Pa. B2	147
Joliet,Ill. A7	142
KansasCity,Mo. S5	154
Kokomo,Ind. C16	149
Minnequa,Colo. C10	153*
Monessen,Pa. P7	147
Pittsburg,Calif. C11	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10	167*
SparrowsPoint,Md. B2	149
Sterling,Ill.(1) N15	146

‡Based on 14c zinc; ‡17.5c zinc.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	132
Atlanta A11	135
Bartonville,Ill.(19) K4	132
Crawfordsville,Ind. MS	134
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	144
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	156
SparrowsPoint,Md. B2	134
Sterling,Ill.(1) N15	132

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa. (31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh 03, PI4	9.85

AXLES

Ind Harbor,Ind. S13	5.65
Johnstown,Pa. B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	127
Aliquippa,Pa. J5	127
Atlanta A11	130
Bartonville,Ill.(19) K4	127
Chicago,Ill. W13	127
Cleveland A9 (44)	125
Crawfordsville,Ind. MS	130
Donora,Pa. A7	127
Duluth,Minn. A7	127
Fairfield,Ala. T2	127
Galveston,Tex. D7	135
Houston,Tex. S5 (44)	126
Johnstown,Pa. B2	127
Joliet,Ill. A7	127
KansasCity,Mo. S5 (44)	130
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	127
So.Chicago,Ill. R2	127
SparrowsPt.,Md. B2	129
Sterling,Ill.(1) N15	127
Torrance,Calif. C11	147
Worcester,Mass. A7	133

STAPLES, Polished Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	129
Bartonville,Ill. (19) K4	126
Chicago W13	127
Crawfordsville,Ind. MS	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
Kokomo,Ind. C16	128
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
SparrowsPt.,Md. B2	128
Sterling,Ill.(1) N15	126
Torrance,Calif. C11	146
Worcester,Mass. A7	132

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.80
Wheeling,W.Va. W10	7.80

TIE PLATES

Fairfield,Ala. T2	4.775
Gary,Ind. U5	4.775
Ind Harbor,Ind. I-2	4.775
Lackawanna,N.Y. B2	4.775
Minnequa,Colo. C10	$65.50*
Pittsburg,Calif. C11	4.925
Seattle B3	4.925
Steelton,Pa. B2	4.775
Torrance,Calif. C11	4.925

*Per net ton.

JOINT BARS

Bessemer,Pa. U5	4.925
Fairfield,Ala. T2	4.925
Ind Harbor,Ind. I-2	4.925
Joliet,Ill. U5	4.925
Lackawanna,N.Y. B2	4.925
Minnequa,Colo. C10	4.925
Steelton,Pa. B2	4.925

STANDARD TRACK SPIKES

Ind Harbor,Ind. I-2, Y1	6.65
KansasCity,Mo. S5	6.80
Lebanon,Pa. B2	6.65
Minnequa,Colo. C10	6.65
Pittsburgh J5	6.65
Seattle B3	7.15
So.Chicago,Ill. R2	6.65
Struthers,O. Y1	6.65
Youngstown R2	6.65

RAILS

	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	60 lb Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675	....	4.25
Fairfield,Ala. T2	....	....	....	4.25
Gary,Ind. U5	3.775	3.675	3.725	....
Huntington,W.Va. W7	....	....	....	5.25
IndianaHarbor,Ind. I-2	3.775	3.675	3.725	....
Johnstown,Pa. B2	....	....	(16)4.25	....
Lackawanna,N.Y. B2	3.775	3.675	....	4.25
Minnequa,Colo. C10	$75.50*	$73.50*	....	4.75
Steelton,Pa. B2	3.775	3.675	....	....
Williamsport,Pa. S19	....	....	....	5.00

*Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
Cr. Cr Hot Work	0.450
Hi-Carbon-Cr	0.535

Grade by Analysis

W	Cr	V	Co	
18	4	1		1.505
18	4	2		1.66-1.66
20-25	4	2-5	1-6	12-25 3.53-3.67
1-9	4	2	7	2.460
18-25	4	2-5	1	4-7 5 2.125
18	4	2	9	2.44-2.45
13.5	4	3		1.602
6	3.25	0.5		1.01

W	Cr	V	Mo	
6-4	4.5	1-2.5		0.96-0.965
6	4	3	6	1.160
1.5	4	1	8.5	0.840

Tool Steel producers include: AE, AS, B2, B8, C4, C9, C13, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

FOOTNOTES

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Chicago or Birm. base.
(6) To jobbers, 3 coils, lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(14) Add 0.20c for 17 Ga. & heavier.
(15) ½" and thinner.
(16) 46 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven Conn., base.
(22) Del. San Francisco Bay area.
(23) 20Ga. 36" wide.
(24) Deduct 0.20c, liner than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.85c.
(27) Bar mill sizes.
(28) Reinforced.
(29) Add $7.50 per ton.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rod or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 12" and narrower.
(36) 14" and narrower.
(37) 15 gage & lighter, 60" & narrower.
(38) 14 gage & lighter 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035", 0.075" and heavier.
(41) 9.25c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.

Key to Producers

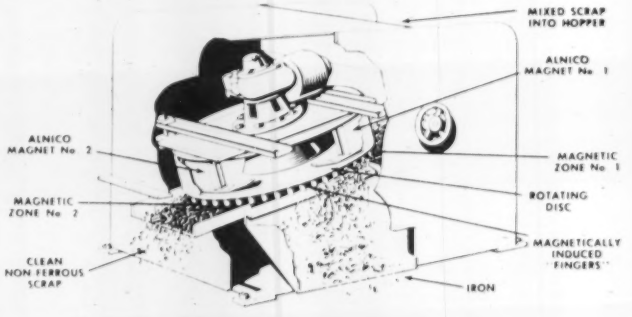
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
N2 National Supply Co.
N3 National Tube Div.
N4 Nelsen Steel & Wire Co.
N6 NewEng.-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Northwest. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P8 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellanceDiv.,EatonMfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sons of Sheffield S.&I. div.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S21 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
U5 United States Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

Here's News

More $$$ for Non-Ferrous Scrap with—

NEW DINGS "MA" NON-ELECTRIC *DUAL ZONE* SCRAP SEPARATORS

DINGS, MILWAUKEE — You'll get more money when you get the iron out with a Dings *Dual Zone* MA — a new scrap separator that handles dry, wet, greasy, or oily flows of loosely entangled scrap with equal ease. Iron is double-trapped in the Dings MA — scrap is passed through *two* magnetic iron removal zones to doubly insure the cleanest product possible.



HOW IT WORKS — Mixed scrap from vibrating feeder flows down chute through two magnetic zones created by powerful, non-electric Dings Alnico Magnets. In each zone iron is picked out and discharged to the side by magnetically induced "fingers" on a rotating disc. Any iron getting through the first zone is removed in the second.

NON-ELECTRIC — You don't need generator sets or rectifiers with Dings MA Scrap Separators. Magnetic permanence of the powerful Dings Alnico Magnet is guaranteed for the life of the separator.

New Bulletin

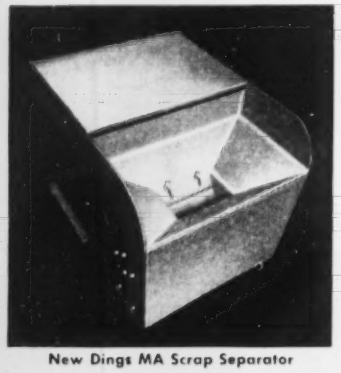
Get the whole MA story in new bulletin B-1600-A. Write, today!

DINGS MAGNETIC SEPARATOR COMPANY

4710 W. Electric Ave., Milwaukee 46, Wis.

DINGS MAGNETS

powerful Dings Alnico Magnet is guaranteed for the life of the separator.



New Dings MA Scrap Separator

OTHER DINGS SEPARATORS

TOP — Double Magnetic Pulley Separator unit at work in one of world's largest non-ferrous metal foundries.

BOTTOM — Rugged non-electric Perma-Drum separating iron chips from red brass.

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
List Per Ft.	8.5c	11.5c	17c	23c	27.5c	37c	58.5c	76.5c
Pounds Per Ft.	0.85	1.13	1.68	2.28	2.73	3.68	5.82	7.62

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	32.5	15.25	35.5	18.25	38	20.75	38.5	20.5	39	21	39.5	21.5	40	21.25	40	21.25
Alton, Ill. L1 (‡)	29.5	10.5	32.5	14.5	35	18	36.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5
Benwood, W. Va. W10	32.5	14.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Etna, Pa. N2 (‡)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	23	40	21.75	40	21.75
Fontana, Calif. K1 (‡)	19.5	0.25	22.5	4.25	25	7.75	25.5	7.5	26	8.5	26.5	9	27	8.75	27	8.75
Ind. Harbor, Ind. Y1 (‡)	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75
Lorain, O. N3 (*)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	28.25	39.5	28.75	40	26.25	40	26.25
Sharon, Pa. M6	32.5	14.25	35.5	18.25	38	21.25	38.5	20.50	39	21.00	39.5	21.50	40	20.75	40	20.75
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75
Youngstown R2 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22	39	23	39.5	23.5	40	22.75	40	22.75
Youngstown Y1 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2	2½	3	3½	4	5	6
List Per Ft	37c	58.5c	76.5c	92c	$1.09	$1.48	$1.92
Pounds Per Ft.	3.68	5.82	7.62	9.20	10.89	14.81	19.18

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5(‡)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (*)	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
Youngstown Y1 (‡)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (‡)	24	7.5	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	4
List Per Ft	5.5c	6c	6c	6c	9.2c	$1.09
Pounds Per Ft	0.24	0.42	0.57	0.76	10.89

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	29.5	+7.25	21.25	+3.5	17.75	+7.75	33	14.25	33	14.25		
Butler, Pa. F6 (‡)	30.5	1.25	23	+1.75	20	+5.5						
Etna, Pa. N2 (‡)	30.5	1.25	23	+1.75	20	+5.5	33	14.25	33	14.25		
Sharon, Pa. M6 (‡)	29.5	1.25	23	+2.25	18	+6.25						
Sharon, Pa. S1 (‡)	30.5	1.25	23	+1.75	20	+5.5						
Sparrows Pt., Md. B2	28.5	+0.75	23	+3.75	18	+7.50						
Youngstown R2 (‡)							33	15.25	33	15.25		
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50						

Galvanized pipe discounts based on zinc price of: (‡), 14c; (‡), 12.50c; (*), 5c, with discounts adjusted depending on price of zinc at time of shipment.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

Cladding	Plates		Sheets		
	Carbon Base		Carbon Base		Copper Base
Stainless	10%	20%	10%	20%	Both Sides
302			19.75	26.24-27.50	77.00
304	25.00	29.50	24.50	27.50-27.77	77.00
309	30.50	35.00			
310	36.50	41.00			111.00
316	29.50	34.00	26.00	35.92-36.50	
317	34.50	39.00			
318	33.50	38.00			
321	26.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	21.25	27.75			
410	20.75	27.25			
Nickel	33.50	45.15			
Inconel	41.25	54.18			165.00
Monel	34.93	46.28			
Copper				44.00	

	Strip			
	Carbon Base			
	Cold-Rolled		Hot-Rolled	
	10%	Both Sides	10%	Both Sides
Nickel	41.00	54.00		
Copper*	23.70	26.64	20.20	26.40

* Deoxidized. Production points for carbon base products: Stainless plate, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville, L7; nickel, copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A14.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	15
⅝-in. & ¾-in.	18.5
⅞-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire Bolts	21
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P.	Reg. Hvy.
Square:	
½-in. & smaller	15 15
⅝-in. & ¾-in.	12 6.5
⅞-in.-1½-in.	9 1
1⅝-in. & larger	7.5 1
H.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ¾-in.	16.5 6.5
⅞-in.-1½-in.	12 2
1⅝-in. & larger	8.5 2
C.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ¾-in.	23 17.5
⅞-in. & 1 5/8-in.	19.5 12
1⅝-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
		Light
½-in. & smaller		35
⅝-in. to ¾-in.		28.5
⅞-in. to 1½-in.		26

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	18 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel, packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	42
¾-in. through 1 in.	34
Longer than 6 in.:	
⅝-in. and smaller	26
¾-in. through 1 in.	4

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvll.fur.	$14.50-15.00
Connellsvll.fdy.	16.50-17.50
New River foundry	20.50
Wise county, foundry	15.50
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.65
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.65
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	28.85
Painesville (‡) ovens	23.00
Cleveland, del.	27.43
Erie, Pa., ovens	22.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
LoneStar,Tex., ovens	18.50
Philadelphia, ovens	23.50
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.66
Saginaw, del.	28.58

*Or within $1.55 freight zone from works.

NOTE: Current prices on boiler tubes, coal chemicals, fluorspar, electrodes and rivets appeared on page 173, Feb. 2 issue.

STAINLESS STEEL

(Add 4.7% on base price and extras)

Type	Sheets	C R Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait., Types 301-347 and 430 sheets, except 303 and 309 E2.

Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa. sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 31.00c on Type 301; 36.50c, 302 38.50c, 304 38.50c, 316 52.00c, 347 39.50c, 410 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Hartford, N. Y., wire Type 302 33.00c; Type 304 34.00c; Type 316 51.00c, including 4.7% increase on base price.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. N.Y., c.l., in bags	10.90
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99+% Fe)	36.50
Unannealed (98+% Fe; minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl iron:	
97.9-99.8% size 5 to 10 microns	$2.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	31.00-34.25
Bronze, 10-ton lots	51.25-60.00
Phosphor Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	35.25
Lead	7.50*
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	46.00
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	83.00
Zinc, 10-ton lots	18.00-31.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh, 1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum:	
99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

* Plus cost of metal

". . . More than 50% of our employees are on the Payroll Savings Plan . . ."

PAUL W. JOHNSTON
President, Erie Railroad

"We on the Erie Railroad are extremely proud that 50% of our employees are on the Payroll Savings Plan for U.S. Defense Bonds. These thousands of employees are regularly providing for their own future security and at the same time contributing to the strength of our national defense. The American habit of thrift and regular purchase of U.S. Defense Bonds Shares in America are evidences of good, sound citizenship."

Good, sound citizen-hip . . . the American habit of thrift . . . a belief that a strong America is a secure America . . . a management that makes the Payroll Savings Plan available to *all* its employees—these are the reasons why more than 50% of Erie Railroad employees are enrolled in the Payroll Savings Plan.

For the same four reasons, more than 7,500,000 employed men and women in thousands of other companies are active members of the Payroll Savings Plan—their take-home savings in the form of U.S. Defense Bonds total more than $150,000,000 per month.

Is your company in the "more than 50% participation" group? If it isn't, please bring this page to the attention of your top executive. Point out to him—

Two Simple Steps to a Successful Payroll Savings Plan

1. Phone, wire or write to Savings Bond Division, U.S. Treasury Department, Suite 700, Washington Building, Washington, D. C.
2. Your State Director, Savings Bond Division, will show your company how to conduct a simple person-to-person canvass that will put a Payroll Savings Application Blank in the hands of *every* employee.

That is all management has to do. Your employees will do the rest. They, like the employees of the Erie Railroad, want to provide for their personal security and at the same time do their part in helping to keep America strong.

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STEEL
The Weekly Magazine of Metalworking

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Baltimore	5.81	7.17	8.37	6.42	...	6.41	7.42	11.17	6.47	6.47	7.70
Boston	6.51	7.36	8.54	6.55	...	6.42	7.49	11.18	6.56	6.75	7.98
Buffalo	5.80	6.65	8.41	6.21	...	5.90	6.95	11.07	6.08	6.30	7.67
Birmingham	5.80	6.65	7.70§	5.80	...	5.80	8.65		5.95	6.10	8.65
Chicago	5.80	6.65	8.00	5.83	...	5.83	6.80	10.65	5.95	5.95	7.18
Cincinnati	6.13	6.72	8.47	6.14	...	6.13	7.16	11.07	6.42	6.47	7.60
Cleveland	5.80	6.65	8.14	6.00	...	5.89	6.90	10.79	6.28	6.12	7.51
Detroit	6.07	6.87	8.64	6.13	7.70	6.12	7.10	10.92	6.42	6.47	7.52
Houston	6.74		8.72	6.89	...	6.98	...	...	6.82	6.78	8.16
Jersey City, N.J.	6.35	7.27	8.47	6.75	...	6.59	7.78	9.54	6.39	6.60	8.01
Los Angeles	6.60	8.45	9.60	6.75	11.20	6.60	8.60	12.05	6.60	6.65	8.90
Milwaukee	5.97	6.82	8.17	6.00	...	6.00	7.07	10.82	6.12	6.12	7.35
Moline, Ill.	6.16	7.00	8.35	6.19	...	6.18	7.16	...	6.30	6.30	...
Newark, N. J.	6.62	7.41	8.63	6.72	...	6.70	7.71	...	6.70	6.78	7.18
New York	6.26	7.27	8.42	6.56	...	6.59	7.53	11.04	6.39	6.60	8.01
Norfolk, Va.	7.60	...	...	...	...	6.44	8.70	...	7.25	6.64	7.33
Philadelphia	6.11	7.15	8.30	6.45	8.30	6.42	7.45	10.76	6.17	6.24	7.36
Pittsburgh	5.80	6.65	8.00	5.94	...	5.83	6.90	10.65	5.95	5.95	7.18
Portland, Oreg.	7.80	9.05	10.00	7.60	...	7.35	9.65	...	7.30	7.30	9.25
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.63	...	6.58	6.68	7.80
St. Louis	6.10	6.94	8.30	6.14	...	6.13	7.20	10.95	6.35	6.35	7.58
St. Paul	6.47	7.31	8.86	6.50	...	6.49	7.57	...	6.61	6.81	7.84
San Francisco	6.90	8.20	9.60	6.75	...	6.65	8.65	12.05	6.50	6.75	8.90
Seattle-Tacoma	7.36	8.24	9.70	7.45	...	7.13	9.62	11.90§	6.87	7.25	9.11
Spokane (city)	7.80	9.40	10.70	7.65	...	7.10	9.70	11.90	7.00	7.10	9.15
Washington	6.31	7.61	8.90	6.89	...	6.90	8.03	...	6.93	6.95	8.17

Prices do not include gage extras. † prices include gage and coating extras except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; * 500 to 1499 lb; § 1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

Old range bessemer	$8.45
Old range nonbessemer	8.30
Mesabi bessemer	8.20
Mesabi nonbessemer	8.05
High phosphorus	8.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates, contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports.

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 67-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid.

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-$42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-$28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	nom.
Domestic (Rail nearest seller)	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $85, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $225 per gross ton of alloy, c.l. packed $237, gross ton lots, packed, $252; less gross ton lots, packed $269; f.o.b. Sheridan, Pa., Alloy, W. Va., Niagara Falls, N. Y., Ashtabula, Ohio or Marietta, O., Lynchburg, Va. Base price: $227, Johnstown, Pa., $228, Etna, Pa., $226, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $13 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $267, less gross ton lots, $284, f.o.b. Chicago. Add or subtract $2.80 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.50c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C. max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 0.5c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 30c, ton lots, 32c; 250 to 1999 lb, 34c; less than 250 lb, 37c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 4.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35; less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.1% max). Contract, ton lot, 2" x D, $4.60 per lb of contained Cb, less ton $4.95 Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $5.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.5-0.75%). Carload packed, 1" x D, 4.6c per lb of alloy, ton lot 17c, less ton lot 19c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr, 5-7%, Fe 20% approx). Contract, carload, packed, ¾" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%, C 1 packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-3 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%, C 1 packed, 14c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base), carloads, f.o.b. seller's works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb. contained Mo f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

Note: For current prices on chromium, silicon, vanadium, boron and tungsten alloys see page 175 Feb. 2 issue; calcium, zirconium, briquetted alloys and refractories, page 115, Jan. 26 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952

STEELMAKING SCRAP COMPOSITE

Feb. 5	$43.00
Jan. 29	43.00
Jan. 1953	43.00
Feb. 1952	43.00
Feb. 1948	40.48

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	Grade 1 No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	41.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	41.00	46.00
Canton, O.	41.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	41.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	41.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	41.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	41.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	41.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	41.00	46.00
Warren, O.	41.00	46.00
Weirton, W. Va.	41.00	46.00
Youngstown, O.	41.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	$1.00
4. No. 2 Heavy Melting	1.00
5. No. 2 Bundles	1.00
6. Machine Shop Turnings	10.00
7. Mixed Borings and Short Turnings	6.00
8. Shoveling Turnings	6.00
9. No. 2 Busheling	1.00
10. Cast Iron Borings	6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	7.50
12. Bar Crops & Plate	5.00
13. Cast Steel	5.00
14. Punchings & Plate Scrap	2.50
15. Electric Furnace Bundles	2.00
Cut Structurals & Plate:	
16. 3 feet and under	7.00
17. 2 feet and under	5.00
18. 1 foot and under	6.00
19. Briquetted Cast Iron Borings	Base
Foundry Steel:	
20. 2 feet and under	Base
21. 1 foot and under	2.00
22. Springs and Crankshafts	1.00
23. Alloy Free Turnings	3.00
24. Heavy Turnings	1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	3.00
27. No. 2 Chemical Borings	4.00
28. Wrought Iron	10.00
29. Shafting	10.00
31. Old Tin & Terne Plated Bundles	10.00

Unprepared Grades

When compressed consistence:

32. No. 1 Bundles	6.00
33. No. 2 Bundles	5.00
34. Other than material suitable for hydraulic compression	8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace, otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries, or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purposes.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and Axles with keyways between the wheelseats	Base
5. No. 1 Busheling	3.00
6. No. 1 Turnings	3.00
7. No. 2 Turnings, Drillings & Borings	12.00
8. No. 2 Cast Steel and uncut wheelcenters	6.00
9. Uncut Frogs, Switches	Base
10. Flues, Tubes & Pipes	8.00
11. Structural, Wrought Iron and or steel, uncut	6.00
12. Destroyed Steel Cars	8.00
13. No. 1 Sheet Scrap	9.50
14. Scrap Rails, Random Lengths	2.00
15. Rerolling Rails	7.00
Cut Rails:	
16. 3 feet and under	5.00
17. 2 feet and under	6.00
18. 18 inches and under	8.00
19. Cast Steel, No. 1	3.00
20. Uncut Tires	2.00
21. Cut Tires	5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	3.00
24. Angles, Splice Bars & Tie Plates	5.00
25. Solid Steel Axles	12.00
26. Steel Wheels, No. 3, oversize	Base
27. Steel Wheels, No. 3	5.00
28. Spring Steel	5.00
29. Couplers & Knuckles	5.00
30. Wrought Iron	8.00
31. Fireboxes	8.00
32. Boilers	6.00
33. No. 2 Sheet Scrap	13.00
34. Carsides, Doors, Car Ends, cut apart	6.00
35. Unassorted Iron & Steel	6.00
36. Unprepared scrap, not suitable for hydraulic compression	8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin, authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3. For preparing into:

(4) Grade No. 25, $6.

(5) Grade No. 19, $6.

(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7) Grade No. 17 or No. 21, $11.

(8) Grade No. 18, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $16.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6. For preparing into:

(3) Grade No. 16, $4.

(4) Grade No. 17, $6.

(5) Grade No. 18, $7.

(6) Grade No. 21, $4.

(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into Grade No. 7, $8.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point.

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakables)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop broken machinery	52.00

OPEN MARKET

(Delivered prices include broker's commission.)

Birmingham

(Delivered)

Shoveling turnings	$30.00-32.00
Cast iron borings	30.00-32.00
No. 1 cupola cast	44.00-45.00
Stove plate	42.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston

(Delivered)

No. 1 cupola cast	37.00
(F.o.b. shipping point)	
Heavy breakable	38.00-39.00
Stove plate	34.00-35.00
Unstripped motor blocks	30.00

Buffalo

(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 1 busheling	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Short shoveling turnings	38.00
No. 1 cupola cast	44.00-45.00
No. 1 machinery cast	47.00-48.00

Chicago

(Delivered)

No. 2 heavy melting	42.50
No. 2 bundles	42.50
Machine shop turnings	30.50-32.50
Mixed borings, turnings	34.50-36.50
Shoveling turnings	34.50-36.50
Cast iron borings	34.50-36.50
No. 1 cupola cast	42.00-44.00
Charging box cast	40.00-42.00
Heavy breakable	37.00-39.00
Burnt cast	33.00-35.00
Cast iron brake shoes	40.00-42.00
Stove plate	40.00-42.00
Clean auto cast	44.00-46.00
Unstripped motor blocks	35.00-37.00
Malleable	46.00-48.00
Drop broken machinery	46.00-48.00

Cleveland

(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	42.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Shoveling turnings	38.00
Cast iron borings	38.00
No. 1 cupola cast	48.00
Charging box cast	47.00
Burnt cast	41.00
Stove plate	46.00
Clean auto cast	52.00
Unstripped motor blocks	41.00
Malleable	52.00
Drop broken machinery	52.00

Detroit

(F.o.b. shipping point)

No. 1 cupola cast	42.00-43.00
Heavy breakable	43.00-44.00
Clean auto cast	49.00-50.00
Unstripped motor blocks	40.00-41.00
Drop broken machinery	50.00-52.00
Charging box cast	44.00-45.00

Los Angeles

(Delivered)

No. 1 heavy melting	34.00
No. 2 heavy melting	29.00
No. 1 bundles	35.00
No. 2 bundles	29.00
No. 1 cupola cast	45.00
Machine shop turnings	14.00

New York

(Brokers' buying prices)

No. 2 heavy melting	35.00
Mixed borings, turnings	28.00
Machine shop turnings	28.00
Cupola cast	40.00
Unstripped motor blocks	32.00-33.00

Philadelphia

No. 1 heavy melting	41.00
No. 2 heavy melting	41.00
No. 1 bundles	42.00
No. 2 bundles	41.00
No. 1 busheling	42.00
Mixed borings, turnings	36.00
Machine shop turnings	32.00
Short shoveling turnings	36.00
No. 1 cupola cast	47.00
Unstripped motor blocks	38.00
Heavy breakable	42.00
Machinery cast	52.00
Charging box cast	45.00-46.00

‡ Ceiling price. † Nominal.
§ Shipping point. ‖ Delivered.

Pittsburgh

(Delivered)

No. 2 heavy melting	44.00
No. 1 bundles	45.00
No. 2 bundles	44.00
Machine shop turnings	35.00
Shovel turnings	38.00
No. 1 cupola cast	46.00
Heavy breakable	43.00

Ceiling price.

San Francisco

(Delivered)

No. 2 heavy melting	27.00
Machine shop turnings	12.00
No. 2 bundles	27.00
No. 1 cupola cast	40.00

Seattle

(Delivered)

No. 1 heavy melting	31.00
(F.o.b. shipping point)	
No. 1 bundles	28.50-29.00
No. 1 cupola cast	40.00
Heavy breakable	36.00-38.00
Unstripped motor blocks	31.00

St. Louis

(Delivered)

No. 1 cupola	48.00
Unstripped motor blocks	37.00

Youngstown

(Delivered)

No. 2 heavy melting	43.00
No. 2 bundles	43.00
Machine shop turnings	34.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.50
Rails, Remelting	35.50
Rails, Rerolling	44.50
Busheling	36.00
Busheling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	32.50
Cast Iron Grades:	
No. 1 Machinery Cast	56.00

‡ F.o.b. shipping point.

For power economy in press operation: A double-pressure pump, automatically lubricated, with totally-enclosed mechanism.

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Absolute Reliability... Maximum Delivery... Low Maintenance Cost...and Smooth Operation

Logemann Brothers offer a complete line of specially-designed High Pressure Pumps in a wide range of sizes featuring both single and double pressure types. Both vertical and horizontal styles are proving highly successful in press and accumulator operations and for hydrostatic test purposes.

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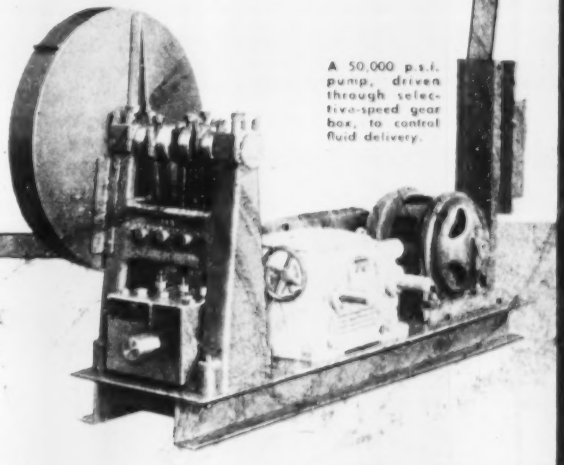
When making inquiries will you please include your pressure and gallonage requirements and indicate the type of application.



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Panel of bare 24ST Aluminum, untreated. Extensive corrosion after 168 hours in salt spray.

Panel of bare 24ST Aluminum, treated with Bonderite 710. No corrosion after 168 hours in salt spray.

Panel of bare 24ST Aluminum, treated with Bonderite 710. In excellent condition after 1008 hours in salt spray.

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ALUMINUM gets increased corrosion resistance, greater durability for paint, with BONDERITE* 710

Here's the surface treatment that practically ends the problem of corrosion on aluminum. Even on high-strength alloys, most susceptible to corrosion, Bonderite 710 protects bare metal for amazingly long periods without failure. Its performance as a base for paint is outstanding.

Bonderite 710 produces an amorphous chromate coating on aluminum surfaces. It can be applied by spray, immersion, or brush, on sheets, castings, forgings and extruded and rolled forms. It operates at low temperatures and is sludge-free.

Bonderite 710 is a liquid—safer and easier to handle, easier to use, more positive in results.

This product's performance equals (*exceeds*, in most important requirements) the government specifications for chemical treatment of aluminum and its alloys.

For bare corrosion resistance, or as a corrosion-resistant base for paint, investigate Bonderite 710 for aluminum.

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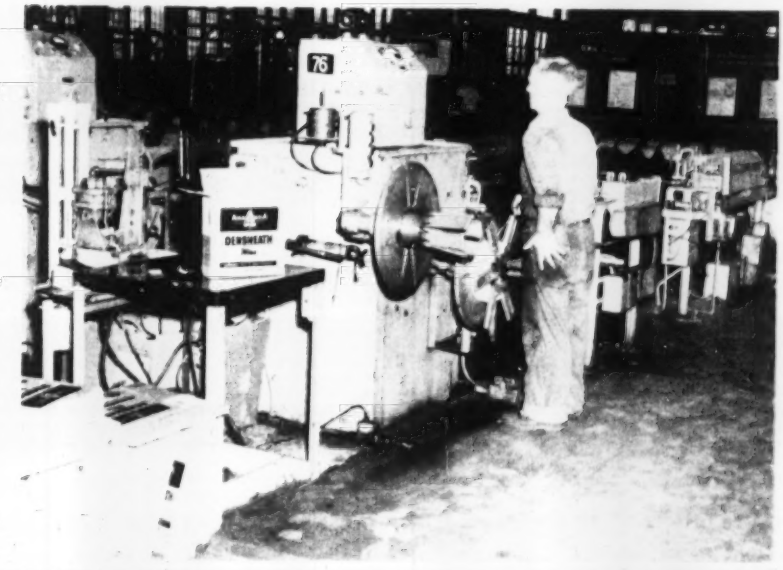
The Metal Market



Hot Time at Anaconda Mill

Production test at the Hastings, N. Y., Mill of Anaconda Wire & Cable Co. sends electric sparks through smaller sizes of wire prior to coiling to detect weakness failure in finished product. The operation is almost fully automatic

Seventh company will enter primary aluminum production field in the U. S. It's the Wheland Co., Chattanooga, Tenn., which plans to start building in the South in July

A SEVENTH member is being initiated into the U. S. primary aluminum fraternity whose membership only a dozen years ago could be counted on a single finger of either hand.

Wheland Co., Chattanooga, Tenn., got a DPA certificate of necessity for quick tax write-off of over $70 million to build two plants, one for alumina processing and another for aluminum reduction. Construction will start in July and will be completed in about two years, Gordon Street, Wheland president, told STEEL. First production will commence in late 1954.

Combination Power — Wheland has power commitments from TVA for a combination of firm and interruptible power, so the reduction plant will be in the TVA area. The Gulf coast has the inside track for the alumina plant, though the south Atlantic coast is being considered also. Bauxite will come from South America.

Aluminum produced will go into stockpile under a five-year contract with General Services Administration. Thus Wheland has no immediate plans for rolling or fabricating the metal, though it has five years to get ready if it decides to. The company operates a gray iron foundry and is experimenting with aluminum castings for possible future production. It also makes oil field drilling equipment.

Revised Offer — Wheland's first offer to DPA was turned down because the company said government financing would be needed. Under the revised offer Wheland itself will put up the money.

A departure from text in the Wheland deal: The other three entrants in the primary aluminum field in the last year and a half—Anaconda, Olin Industries and Harvey Machine—either have facilities for fabricating aluminum or have plans for building them. Addition of the seventh producer oversubscribes DPA's third-round expansion goal by 11,000 tons.

Copper Decontrol Will Lag

Copper will probably be one of the last metals to see decontrol.

A number of other controls patently unnecessary will be dropped first; the government also wants time to plan or institute buying plans for stockpile. An indication of the government's and some foreign producers consensus as to the future price of copper comes in reported bulk purchases for the next two years at 30 cents. The contract with four Canadian producers for substantial tonnages contains provisions for a two-year extension with an escalator clause.

Lead, Zinc Prices Tumble

Lead and zinc are rapidly nearing the 10-cent level they left in 1946-47. Both took a tumble last week, lead leading the way this time by dropping to 13.50 cents, New York. Zinc followed the next day, is quoted at 11.50 cents, E. St Louis. Buyers note the price is in line with import quotations but are still sitting on their hands.

Nonferrous Briefs

Distribution controls in some form will be kept on critical materials such as cobalt, nickel, tungsten. Market men wonder whether this system will be used temporarily with such metals as copper and aluminum.

Aluminum fabricating operations are slack in Britain, so it was no sacrifice to arrange the loan of another 22,000 tons of ingot from that country, to be supplied by Aluminum Co. of Canada.

Dow Chemical Co.'s $30 million magnesium rolling mill will be ready for operation this fall. Capacity is 500 tons monthly and the specialty will be thin gage sheets.

Aluminum mill products prices aren't likely to go up with decontrol. The price is right for producers now and another increase might mean a loss of customers who will be needed to take the second half's swollen output.

STEEL'S Metal Price Averages for Jan., 1953

(Cents per pound)

Electrolytic Copper, del. Conn.	24.500
Lead, St. Louis	13.838
Prime Western Zinc, E. St. Louis	12.596
Straits Tin, New York	121.50
Primary Aluminum Ingots, del.	20.173
Antimony, f.o.b. Laredo, Tex.	34.500
Nickel, f.o.b. refinery	58.654
Silver, New York	84.442

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2-.025c 27.5; 40-grade 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 406) 23.25c.

Zinc: Prime western 11.5c; brass special 11.75c; intermediate 12.00c; East St. Louis; high grade 12.85c; and special high grade 13.00c, delivered.

Lead: Common 13.30c; chemical 13.40c; corroding 13.40c; St. Louis.

Primary Aluminum: 99% plus, ingots 26.50c; pigs 25.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades notch bars, granulated or shot, Grade 1, 18.50c; grade 2, 18.00c; grade 3, 18.00c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%), standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99.99.8% and over but not meeting specifications below 34.50c; 99.8% and over, arsenic 0.05% max., other impurities 0.1% max., 35.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes 99.9%, base sizes at refinery, unpacked, 60.00c; 25-lb pigs, 62.62c; "XX" nickel shot, 63.62c; "F" nickel shot or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Mercury: Open market, spot, New York, $210-$215 per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms $2 dr; special or patented shapes $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (cases); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 89.2c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $175-$185 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective July 1, 1952)

Sheet: Copper 45.52; yellow brass 40.17; commercial bronze, 95% 45.15, 90% 44.38; red brass, 85% 43.10, 80% 42.34; best quality 41.33; nickel silver, 18% 55.08; phosphor bronze grade A, 5% 64.71.

Rod: Copper, hot rolled 41.37, cold drawn 42.62; yellow brass free cutting 33.85; commercial bronze 95% 41.81, 90% 41.07; red brass 85% 42.79, 80% 42.01.

Seamless Tubing: Copper 45.56; yellow brass 43.18; commercial bronze 90% 47.04; red brass 85% 46.01.

Wire: Yellow brass 40.46; commercial bronze 95% 45.41, 90% 44.67; red brass, 85% 43.39, 80% 42.63; best quality brass 41.91.

(Base prices, effective July 1, 1952)

Copper Wire: Bare, soft, f.o.b. eastern mills; 100,000 lb lots 32.75c; 30,000 lb lots 32.92; l.c.l. 33.42. Weatherproof 100,000 lb, 33.60; 30,000 lb 33.85c; l.c.l. 34.35. Magnet wire del. 15,000 lb or more 38.75; l.c.l., 39.50.

ALUMINUM

(30,000 lb base, freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In. Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle Base
0.249-0.136	12-48	32.9		
0.135-0.096	12-48	33.4		
0.095-0.077	12-48	34.1	31.8	36.3
0.076-0.061	12-48	34.7	32.0	36.5
0.060-0.048	12-48	35.0	32.2	36.8
0.047-0.038	12-48	35.5	32.6	37.1
0.037-0.030	12-48	35.9	33.0	37.5
0.029-0.024	12-48	36.5	33.3	38.3
0.023-0.019	12-36	37.1	34.0	39.0
0.018-0.017	12-36	37.9	34.6	39.9
0.016-0.015	12-36	38.8	35.4	41.1
0.014	12-24	39.8	36.4	42.4
0.013-0.012	12-24	40.9	37.1	43.4
0.011	12-24	41.9	38.3	45.0
0.010-0.0095	12-24	43.1	39.4	46.6
0.009-0.0085	12-24	44.3	40.7	48.5
0.008-0.0075	12-24	45.8	41.9	50.3
0.007	12-18	47.3	43.4	52.6
0.006	12-18	48.9	44.8	57.6

*Lengths 72 to 180 inches. †Maximum diameter 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round 17S-T4	Hexagonal 17S-T4
0.125	56.8	...
0.156-0.0[illegible]88	48.0	...
0.219-0.313	45.3	...
0.375	43.7	52.4
0.406	43.7	...
0.438	43.7	52.4
0.469	43.7	...
0.500	43.7	52.4
0.531	43.7	...
0.563	43.7	49.2
0.594	43.7	...
0.625	43.7	49.2
0.688	43.7	49.2
0.750-1.000	42.6	46.4
1.063	42.6	44.8
1.125-1.500	41.0	44.8
1.563	40.5	...
1.625	39.8	43.2
1.688-2.000	39.8	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 11c sq ft or more $19.00 per cwt, add 50c cwt 100 sq ft to 10c sq ft. Pipe: Full coils $19.00 per cwt. Traps and bends: List prices plus 43%.

ZINC

Sheets 23.00c f.o.b. mill 30,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 30,000 lb and over. Plate: not over 12-in., 20.75-21.75c; over 12-in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill effective Dec. 15, 1952) Sheets, cold rolled 79.50c; Strip, cold rolled 85.50c; Rods and shapes 75.50c; Plates, 77.50c; Seamless tubes, 105.50c.

MONEL

(Base prices f.o.b. mill effective Dec. 15, 1952) Sheets, cold rolled 63.00c; Strip, cold rolled 66.00c; Rods and shapes 61.00c; Plates, 62.00c; Seamless tubes, 96.00c; Shot and blocks 54.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9%, flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled 42.18c; oval 41.68c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 68c; 2000 to 9000 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11, more than 2000 lb $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 100 lb bbl $1.25, 100 lb kegs $1.28, f.o.b. Carteret, N. J., freight allowed on 100 lb or more.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.00	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	19.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass 17.00 per lb of dry Cu content for 58 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; rocks and tailings 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap, 28 solids, copper free 16.50; high grade borings and turnings, 8.50; No. 12 piston borings and turning, 7.50; Mixed plant scrap, Copper-free solids 10.00; dual type 9.00; Obsolete scrap, Pure old cable 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 10.25-10.75; battery plates 5.25-5.50; linotype and stereotype 12.00-12.50; electrotype 10.25-10.50; mixed babbitt 13.75.

Zinc: Old zinc, 5.00; new die cast scrap, 5.00; old die cast scrap, 4.00-4.25.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Feb. 3	24.50	13.30	11.50	121.50	20.50	34.50	60.00	88.25
Feb. 2	24.50	13.30	12.00	121.50	20.50	34.50	60.00	88.25
Jan. 27-31	24.50	13.30	12.00	121.50	20.50	34.50	60.00	88.25
Jan. 22-26	24.50	13.80	12.50	121.50	20.50	34.50	60.00	88.25
Jan. 16-21	24.50	13.80	12.50	121.50	20.00	34.50	60.00	88.25
Jan. 15	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.75
Jan. 14	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.25
Jan. 13	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.78
Jan. 12	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.25
Jan. 7-10	24.50	14.30	13.00	121.50	20.00	34.50	56.50	83.25
Jan. 2-6	24.50	14.55	13.00	121.50	20.00	34.50	56.50	83.25
Jan. 1953 Avg.	24.50	13.838	12.596	121.50	20.173	34.50	58.654	84.442
Feb. 1952 Avg.	24.50	18.80	19.50	121.50	19.00	50.00	55.50	88.00
Feb. 1948 Avg.	21.50	14.825	12.00	94.00	15.00	33.00	33.75	74.625

NOTE: Copper: Electrolytic del. Conn. Valley; Lead, common grade del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits del. New York. Aluminum primary ingots, 99% del.; Antimony, bulk f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices cents per pound, except silver, cents per ounce.

"she might have been my kid..."

"There was no time to stop, see? She comes running out from behind this parked car right under my wheels. Her hair is in pigtails, and with the sun shining on it, she might have been *my* kid. We got her to the hospital. It took 3 pints of blood to bring her around. All I have to do is remember the sound of those screaming tires—and I know why *I'm* giving blood."

Yes, all kinds of people give blood—truck drivers, office workers, salesmen. And—for all kinds of reasons. But whatever *your* reason, this you can be sure of: Whether your blood goes to a local hospital, a combat area or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Business Executives!
✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed your employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

Give Blood Now

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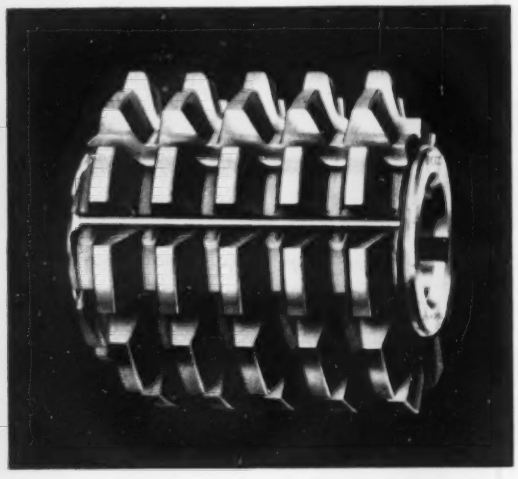
NATIONAL BLOOD PROGRAM

Accurate Unground Hobs

REDUCE TOOL COSTS



For Semi-Finish Hobbing

Since Accurate Unground hobs cost considerably less than ground hobs, they should be applied whenever job requirements permit. Class C Accurate Unground hobs are used primarily on pre-shaved gears. Many users consider the gears produced by these hobs to be sufficiently accurate for efficient operation of the shaving cutter. Special features, such as the ramp for cutting the chamfer and the protuberance for producing undercut, can be held to sufficiently close tolerances to satisfy the requirements of most gears.

For increased production of pre-shaved gears, multiple-thread Accurate Unground hobs are often used. The increased production of the multiple thread feature and the reduced tool cost of the Accurate Unground hob have provided exceptional savings on many jobs.

For Finish Hobbing

Accurate Unground hobs are also used for some *finish* hobbing jobs, although they are not as consistently accurate as ground hobs. Consequently, they are used for finishing jobs which do not require the consistently closer tolerances of ground hobs. In addition to the saving in tool cost, Accurate Unground hobs often have a greater tool life than those with a ground form.

To determine the advisability of adapting Accurate Unground hobs to your jobs, consult your nearest Barber-Colman representative. He will be glad to help you with any of your gear problems.

FOR ACCURACY SELECTION — *Send for Copy of New Hob Standard Tolerances*

Barber-Colman Company

COLMAN

GENERAL OFFICES AND PLANT, 772 ROCK STREET, ROCKFORD, ILLINOIS

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 157

Boston—Distributors and fabricators of concrete reinforcing bars are taking in more tonnage. Major problem with most of them now is keeping pace on engineering requirements. Placement of tonnage at job sites has been heavy this winter; little time has been lost due to weather and during lull in new inquiry some shops got closer to schedule. More volume is now being estimated, bridges and housing leading. Contractors' estimates average 10.00c to 11.00c per pound for bars in place.

Seattle—Public works projects are calling for sizable tonnages of reinforcing bars. The largest involves 2000 tons for the Little Porcupine dam, Montana, on which bids are due Mar. 12; 1000 tons for the East Low canal, Columbia Basin project, bids Mar. 3. Rolling mills report increasing inquiry for small lots of reinforcing for both public and private construction. Requirements of the Alaska area are increasing.

Merchant bars are not active. Reinforcing output is about 75 per cent of the total; merchant, 25 per cent or less.

Sheets, Strip . . .

Sheet and Strip Prices, Page 157 & 158

New York—Appliance manufacturers are encouraged over prospects for the next several months and, accordingly, are pressing for light flat rolled tonnage. Sellers of hot and cold sheets are experiencing a particularly brisk demand and anticipate far more inquiry than they can handle during the first half of this year. Some will go into the second quarter with arrearages of a month on these particular products. Galvanized sheet demand is relatively less pressing, but even in this product most sellers are confident they will have all the tonnage they care to handle for at least several months to come. There appears to be ample capacity for the business offered in straight chromium and nickel-chromium grades. However, the situation in nickel-chromium isn't due to the fact that consumers would not like to have the material, but rather to the fact that government limitations on nickel have interfered with their obtaining necessary ratings in many instances.

Boston—Heavier second quarter allotments to producers of civilian-type consumer goods may mean more tickets authorizing additional flat-rolled tonnage, but the trick will be to translate them into firm orders. As mill books now read, this volume will have to be fitted into May and June space against spot openings, already limited for May. Most consumers would rather be long than short on allocation tickets. Lack of allotments curtailed some first quarter buying. There are also some group consumers aiming at higher inventory. Suppliers to the automotive industry are not included in the latest bonus and these shops are hardest pressed for sheets and strip.

unable to get sheets, more users are substituting slit cold-rolled strip. Nonintegrated producers of narrow cold-rolled strip could take up their share of this volume if their supplies of hot-rolled improve. Currently this hot-rolled balance is a major problem with converters. On stainless, 400 series, several suppliers are more extended than on low and medium carbon.

Philadelphia—Demand from manufacturers of pressed metal sanitary ware, refrigerators and deep freeze units, radio and television, including television tubes and air-conditioning equipment, is especially active in the local sheet market. Stove requirements are improving. Automotive requirements also are brisk, affecting some of the specialties, such as straight chromium strip which is now being used in greater degree to replace chromium plated parts. Demand for nickel-chromium steel for various applications is in direct proportion to nickel allowances by Washington. Coated sheets are not in as strong demand as hot and cold sheets, but requirements are still larger than most mills can meet. One large producer says that the relative easing simply means that he has to turn away less tonnage. Hot strip up to 5 in. in width, inclusive, is very tight; above 5 in. supply is not so tight, although demand still exceeds offerings.

Pittsburgh—Demand for sheet and strip from warehouses is easing to some extent, but not sufficiently to indicate any immediate softening in the market. Galvanized sheet demand remains active. Supply of hot and cold-rolled material is the tightest of those in the flat-rolled classification. Appliance manufacturers are exerting maximum pressure to get more long terne and electric sheets.

Chicago—Consumers of sheet, hot-rolled as well as cold-rolled, are pressing producers for all the tonnage they can get. There is no indication yet that heavy production of flat-rolled products is approaching a catch-up in demand. Neither is there reason to believe that working inventories are improving.

Birmingham—No letup is in prospect in consumer demand for sheets, although strip is in somewhat better supply. Mills are exerting every effort to take care of sheet requirements but that is a goal they have had for some years in this territory where diversity of production has shown remarkable growth.

Tubular Goods . . .

Tubular Goods Prices, Page 161

Boston—Small volume of butt weld pipe allotments for March, turned down by distributors, is readily sold in other directions; distributors' stocks in this grade are now well balanced. Short are smaller sizes of seamless, under 10 in. and pressure pipe. Light wall electric welded tubing in low carbon grades is in excess of demand; stainless is moving better. Merchant steel pipe is sold well through first half on direct shipments.

Pittsburgh—Balance of supply and demand is approaching for welded tubular goods. By midyear customers of producers in this district will be experiencing an easier inventory position. Seamless tubing will be

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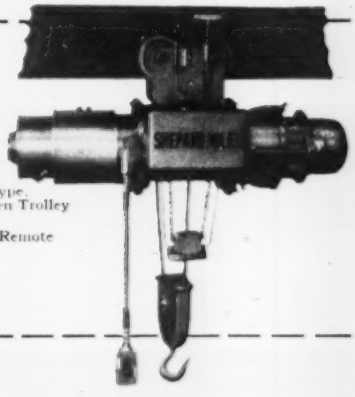
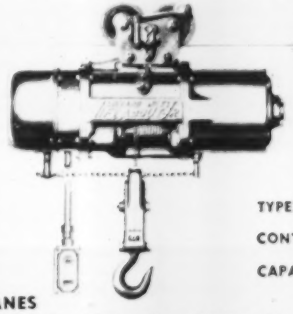


TYPES: Lug Suspension, Hook Suspension, Base Type, Push Trolley, Geared Trolley, Motor-driven Trolley

CONTROLS: Pendant Rope, Push Button, Outrig, Remote

CAPACITIES: 500 to 40,000 lbs.

SPEEDS: To meet your requirements—Write for latest bulletins



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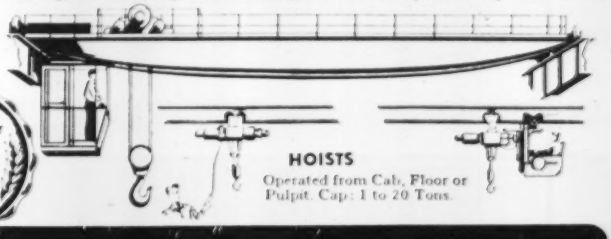
Overhead: Top Running, Inner Running, Under Running, Floor or Cab Operated. Cap.: 1 to 450 Tons.



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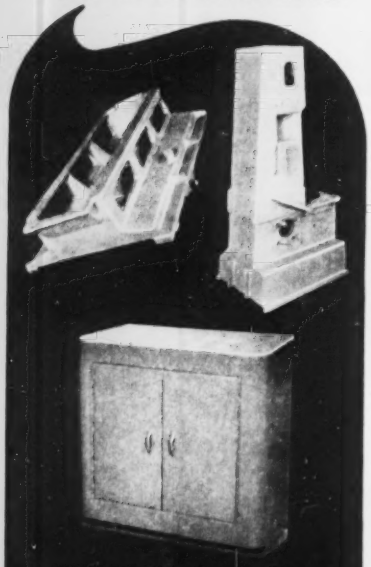

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tighter through most of the year. Active demand is expected to continue for at least 18 months. Sparkplug for this development is the atomic energy program.

St. Louis Pipe demand remains heavy, particularly for sizes 1 in. and smaller. Producers have been filling each quarter's books conservatively but are nevertheless 30 days behind on delivery promises.

Los Angeles Public Utilities' requirements sustain pipe demand. Southern California Gas Co.'s $32 million program for 1953 calls for 44,347 tons of pipe compared with 18,126 tons in 1952. Specified are 29,716 tons of new pipe 16 in. and larger, 3,415 tons from 6⅝ in. to 16 in., and 10,216 tons under 6⅝ in.

Seattle Demand for cast iron pipe is slow. Some proposed government installations shortly will call for fair tonnages. No important projects are up for immediate bidding.

Steel Bars . . .

Bar Prices, Page 157

Boston Pressure for bar tonnage is easier from drop forge shops; one has held up some first quarter shipments, and, where allotments are lower or unchanged, there is no violent reaction. Part of the answer is that shipments to forge shops have been heavy for some weeks. There are limited openings for carbon and alloy shipments in June; only potential space for May. Demand for bars, 1 in. and over, also flats, is in excess of supply in hot-rolled, but there are spots where jobbers and consumers are not taking all second quarter cold-rolled tonnages allocated. This applies also to some larger sizes. Demand for sulphur machining grades is well sustained, but more production is from open hearths, resulphurized process at expense of bessemer. Not much bar tonnage may be expected from Morrisville, Pa., production before fourth quarter.

New York Demand for small hot carbon bars, 1 in. and under, has stiffened following a slight easing. Meanwhile, pressure for the larger sizes continues strong, with second quarter requirements in excess of what the mills indicate they can handle. On commercial work, April has been blanked out in some instances, mills endeavoring to become more current. Cold drawers, booked 40 to 50 per cent on high rated military requirements, are not able to meet all of the nondefense requirements offered, especially in the larger sizes. Most cold drawers haven't committed themselves fully for the second quarter on nondefense work, preferring to move slowly on a selective basis.

Philadelphia Pressure for shell steel has placed a further squeeze on large bar rounds. This, combined with an active commercial demand for a wide diversity of sizes, even now including once more sizes under 1 in., has given a strong tone to the entire hot bar-carbon line.

Los Angeles Aircraft demand for specialty and alloy bars has slumped 30 per cent in the last 30 to 60 days. Plane schedule readjustments is given as the reason by fabricators.

Wire . . .

Wire Prices, Page 159

Pittsburgh Present demand for high and low carbon wire products is much greater than the ability of mills to turn it out. Merchant wire products are moving slowly, but some slight increase is expected during the second quarter. Demand for wire to be rolled into B-X cable has slumped, but it is generally regarded as seasonal. Deliveries are on a current basis for all wire products, within limits of quota allocations.

Plates . . .

Plate Prices, Page 157

Boston Weldment shops are booking more volume, reversing trend of fourth quarter and for most part halting inroads on backlogs. Heavy plates for this tonnage are covered by high ratings, including Z-2, and concern is expressed as to procurement of current volume without control of distribution. Weldment shops, like other users of heavy plates, are unable to place substantial nonrated commercial orders. Allotments of high tensile material to shipyards, notably Bath, Me., for destroyers, will tighten low alloy plate supply. Not much increase, if any, will be open for heavy plates in June. Only improvement in supply covers light plates, 36 in. and narrower. Floor plate supply is in balance with demand. Pressed head deliveries average 8 to 10 weeks in smaller sizes and spun heads 10 to 12 weeks; larger diameters are extended two weeks more in both categories. Straight chromium clad stock can be obtained in two months.

New York Tank fabricators generally have heavy backlogs, although they are leveling off. One leading fabricator of water tanks reports that the best he can do on a sizable job is a year. Extension of such promises is due in part to unbalanced inventories, although demand from both municipalities and industry is holding up much better than anticipated even a couple of months ago. In addition, there is quite a little work for the Atomic Energy Commission and other federal government agencies. All this adds up to a good year in 1953, this fabricator says. Plate supply is perhaps not quite as tight as it was late last summer and fall, when producers were recovering from the steel strike, but it is still tight with few indications of a balance between supply and demand in the first half.

Pittsburgh Users of lighter steel plates are in a better inventory position than they have been at any time since the steel strike. Heavy military demand is keeping users of heavy gage steel plates operating on a hand-to-mouth basis. Barring any radical revision in military allocations, demand for heavy plates will continue strong through the third quarter.

San Francisco Limited sales of plates from Japan and Europe are being made in the local market from time to time at prices close to or slightly under the domestic levels.

Seattle Demand for plates con-

tinues strong, little improvement in supply being noted. Small operators are the most seriously affected. Sizable tonnages of plates are involved in air force base expansions in Washington and Montana, also construction for the Atomic Energy Commission.

Structural Shapes . . .

Structural Shape Prices, Page 157

Boston Only for fill-in spot tonnage in wanted sizes to meet delivery specified are fabricating shops buying higher priced plain structural material. Competition for construction contracts is sharper with both price and delivery important factors in making the awards. Active bridge work estimated approximates 1200 tons. District shop backlogs range up to three months, but larger integrated shops are more extended, August-September; fabricators in this category are sold up to allotments.

New York State thruway work dominates structural demand. On Feb. 11 bids will be closed on several projects, including 6000 tons for Greene county, 3200 tons for Montgomery county, and a smattering of other projects involving several hundred tons each. Meanwhile, American Bridge Division, United States Steel Corp., submitted the low bid on 9000 tons of approach work in connection with the proposed Hudson river bridge, off Rockland county. Relatively little commercial work is noted.

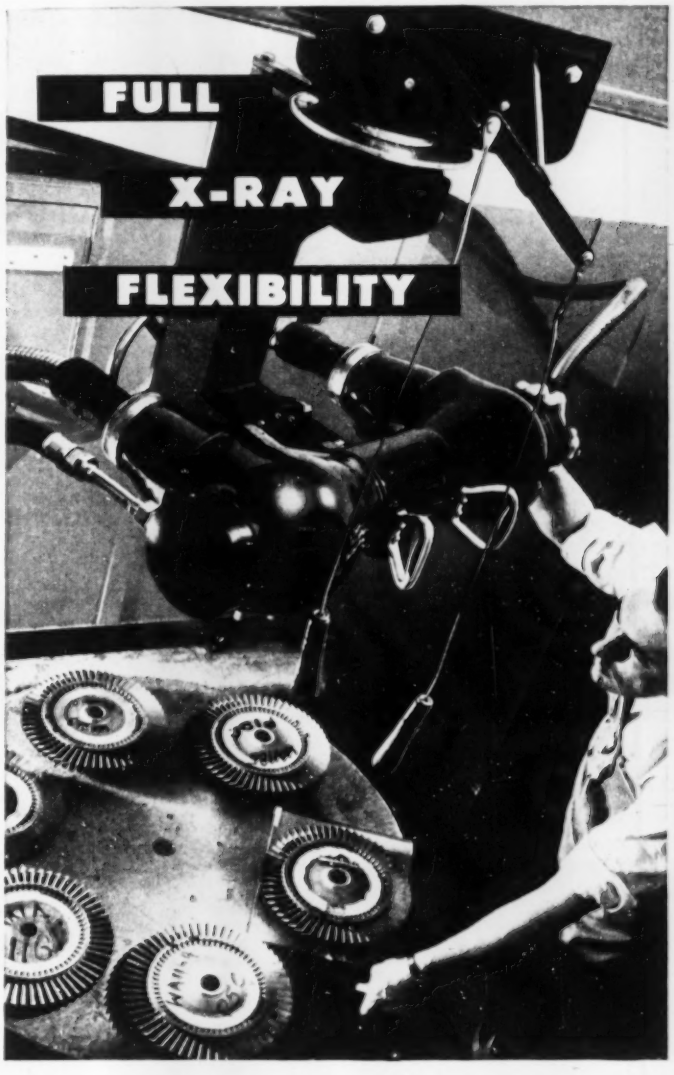
Philadelphia Structural demand still is comprised largely of public work. Industrial activity is well over the hump, and miscellaneous commercial work, such as stores, office buildings and apartments continue to reflect governmental restrictions in one degree or another. Small fabricating shops, unable to figure on much of the larger public construction, such as bridges in particular, are competing strongly for such small business as is coming out.

Philadelphia One fabricator of light oil storage tanks recently had to lay off 60 men temporarily because of lack of plate. While this is exceptional, most plate fabricators have difficulty obtaining sufficient tonnage to meet requirements. Substantially more requests for plates for nondefense work for second quarter are being received than the mills are scheduling. Some mills haven't opened their books for the entire period, but say they could fill up quickly if they cared to do so.

Pittsburgh No strong evidence of stocking structural steel is yet apparent. Steady pressure is being exerted on mills by fabricators for larger shipments.

Ceco Steel Products Corp., Chicago, will begin construction of a new plant May 1. Among other items which will be produced are standard and long-span steel joists and steel roof deck.

Seattle—Important jobs involving shapes are developing, including two projects at Fairchild Air Field, near Spokane, Wash., bids within 45 days. One for ten hangars will require 2850 tons of shapes; a cantilever maintenance hangar, 1500 tons, in addition to plates for storage tanks, pipe,



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Jib crane tubestand and X-ray tubehead flexibility allows maximum ease of positioning in radiographing parts of all sizes and shapes. Result: time is saved, output is stepped up.

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etc. Pacific Car & Foundry Co., Seattle, will fabricate 700 tons in two contracts for expansion of Alcoa's Vancouver, Wash., aluminum plant.

The supply situation is improving slowly but fabricators are still handicapped by scarcity of plates and wide flange beams. Alaska construction requirements will be of importance during the first half.

Pig Iron . . .

Pig Iron Prices, Page 156

Philadelphia—With the Chester, Pa., stack, operated by a Barium subsidiary, down for relining, its affiliate, the Phoenix Iron Co., Phoenixville, Pa., is bringing in basic from Belgium. A cargo of 5000 tons is enroute, with another similar tonnage said to be scheduled later. A shipment of 1200 tons of Spanish bessemer is scheduled to arrive in Philadelphia in mid-February for a district consumer. Domestic supply of foundry iron continues generally adequate.

Reduction in the all-rail freight rate from the South to river points in this district as far down the Delaware as Wilmington and scheduled for Feb. 1 has been postponed, pending further hearings.

Boston—That pig iron supply has eased to a considerable extent in other eastern districts is indicated by substantial offerings of tonnage during suspension of production at Everett, Mass. Moderate volume of tonnage has been bought and no serious shortages developed. Foundry melt is well below capacity, notably with textile mill equipment shops, normally among the largest consumers. Foreign iron, both foundry and basic grades, is available at competitive prices, but sales are slow. Basic supply also has eased.

New York—Encouraging to pig iron sellers here is a slight improvement in activity at a number of smaller district foundries. Though slight, the feeling is that foundry business is definitely on the upturn and that still better days lie ahead this month. This, combined with the fact that some consumers are building up their inventories a bit as a result of the lifting of the 30-day limitation to 60 days, is accounting for a better flow of iron. However, there is no stringency in supply.

Buffalo—Tightening of the merchant pig iron market is reported here. The trade is buoyed by improvement in demand from smaller foundries. Noted also is the fact that production of merchant iron accounts for a larger portion of total output than had been recorded recently. An increase in merchant iron requirements is reported from general foundry melters as well as melters for automotive equipment. Shipments to eastern consumers are light.

Chicago—Pig iron demand is strong, but supply has improved to a point where shipments are adequate and orderly. Consumers would like more iron, but do not protest when sellers cannot accommodate. Every indication is that foundry operations are at the highest level since end of the steel strike. Order outlook appears bright.

Birmingham—Merchant pig iron interests are meeting demands pretty well and have had some free iron in moderate tonnage from time to time. Expectations are that the tightness in supply probably will be evident again as foundry activity picks up after a slackening period.

San Francisco—Australian pig iron has found its way into the market here in extremely limited quantities. About 300 tons have moved in recently and sold to foundries slightly below the price of domestic pig. The analysis of the Australian pig iron, however, is such that it is suitable only for certain types of foundry operations.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 161

Philadelphia—Oven coke is in easier supply, reflecting the suspension of the Chester blast furnace. This furnace went down more than two weeks ago for 60 days.

Chicago—Demand for foundry coke has picked up recently and provides a measure of better production of castings. With coke in adequate supply—a situation which has prevailed for months—few foundries carry heavy stocks. Thus, the increase in fuel orders is a direct index of heavier consumption.

Warehouse . . .

Warehouse Prices, Page 163

Boston—Although more steel is reaching warehouses, inventories are being accumulated on only a limited number of products, including galvanized sheets and cold-finished bars under one-inch. Structurals, cold sheets, plates and larger bars move promptly as received, although smaller sizes of these are in better supply at some warehouses. Distributors are getting allotments against base tonnage, but frequently late. Some are still waiting for partial December shipments. Nails are plentiful with some easing in prices.

Philadelphia—While generally no longer accepting substitutes as to size or grades, warehouse buyers are still pressing for tonnage. Distributors have difficulty in keeping popular specifications in stock. Although keeping a close eye on over-runs so as not to get an undue accumulation of them, they are taking in all the stock sizes of plate they can get. They are pressing the mills for hot carbon bars and structural shapes, especially in the range up to 10 and 12 in. More stock is needed in hot and cold sheets. Galvanized sheets, particularly in the light gages, are not moving too briskly, but, according to one large distributor, are not dragging too much, either. All jobbers anticipate a good first quarter and in all probability, so they say, a good second quarter as well.

Birmingham—Warehouse stocks improve slowly. Small tonnage plate users have been less insistent for several weeks, but bars are in exceptionally tight supply.

Seattle—Distributors report sustained demand for all out-of-stock items. The customary winter decline in sales has been absent this season as mild weather has permitted uninterrupted construction. While the

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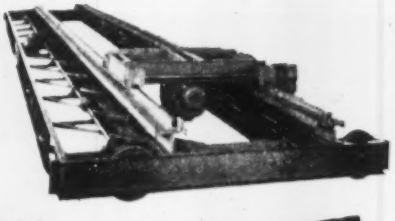

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sheet situation is improved, plates are still critical. Hot-rolled and wide flange sections are in extremely tight supply. Inventories are still subnormal. Coast mills are holding close to scheduled deliveries, about 30 days, but eastern producers are said to be lagging in completing commitments.

Los Angeles Fabricators report warehouses well-stocked on smaller bar sizes. One telephone call, they say, fills requirements compared with 10 to 20 telephone calls previously required.

Scrap . . .

Scrap Prices, Page 164

Detroit The slowness in blast furnace scrap that has plagued the East and West coasts is hitting this district now. Borings and turnings are quoted $2.00 to $3.00 lower; some dealers say they just haven't got any orders and they can't tell how far the price has dropped until they start selling. The furnacemen would rather use the ore which now appears plentiful through May, well after the shipping season starts again, and they claim scrap will have to fall to a competitive price before it begins selling again. Steelmaking scrap also is taking a tumble, though not quite so far. Pig iron prices are still too close to the scrap price level. As a result, now that pig iron is becoming more plentiful, the mills are buying the pig and will continue to do so until scrap is again competitive.

Boston Cast scrap prices are sagging again. Heavy breakable is quoted $38 to $39, f.o.b. shipping point, while No. 1 cupola is $2 a ton lower at $37, delivered. Cast grades are moving slowly. Inventories at the current rate of melting are ample. Shipments of steelmaking grades are steady at about the same rate as yards are taking in tonnages. Steelmaking grades are quoted at ceiling levels, but there are rumors of exceptions in turnings.

New York Scrap market remains sluggish, particularly with regard to cast grades. Brokers have eased their offerings on unstripped motor blocks to $32-$33. Steel scrap is moving fairly actively, but there is little consuming pressure.

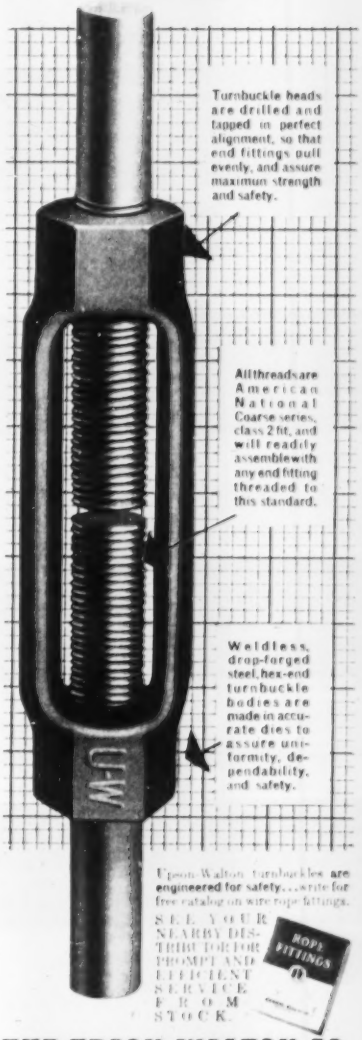
Buffalo Mixed tendencies rule the scrap market here. The second largest consumer in the area placed new contracts for about 1100 tons of steelmaking grades at ceiling levels. New supplies of open-hearth grades are light while at the same time new business tended to increase, strengthening the market. On the other hand, new orders for No. 1 cupola cast scrap were booked at prices $2 to $3 below previous levels. Cast grades have been accumulating in dealers' yards because of light demand.

Pittsburgh Scrap purchasers are proceeding with caution now that controls will be lifted on Apr. 30. Inventories are still large and are being maintained by the steady flow of customer and home scrap. The big question facing market interests is whether to buy or wait; no trend toward either course of action is apparent at this early date.

Philadelphia — Consumers of steel scrap are taking in shipments freely,

UPSON-WALTON turnbuckles

ENGINEERED FOR SAFETY


Turnbuckle heads are drilled and tapped in perfect alignment, so that end fittings pull evenly, and assure maximum strength and safety.
All threads are American National Coarse series, class 2 fit, and will readily assemble with any end fitting threaded to this standard.
Weldless, drop-forged steel, hex-end turnbuckle bodies are made in accurate dies to assure uniformity, dependability, and safety.
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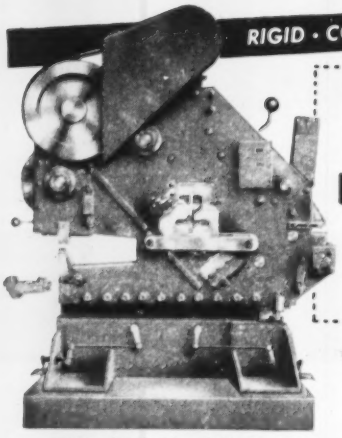

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Shears Plates	7/16"	1/2"	5/8"
Shears Flats	3-3/16" x 9/16"	3-3/16" x 5/8"	4" x 3/4"
Shears Angles (Square Cut)	3 1/8" x 5/16"	4" x 3/8"	5" x 1/2"
Shears Tees	3 1/8" x 5/16"	4" x 3/8"	4 1/4"
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Shears Square	1"	1 1/4"	1 1/2"

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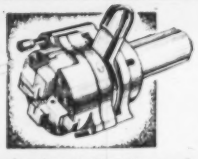

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although rejecting off-grade material. One district mill recently rejected substantial amounts of No. 2 bundles as being off grade. Cast scrap is easy, with No. 1 cupola now holding at $45, delivered; unstripped motor blocks at $39, delivered; and charging box cast at $45-$46, delivered.

St. Louis Scrap steel buying is somewhat easier. Shipments are failing to pick-up despite favorable weather. Dealers are not inclined to buy from brokers with deliveries uncertain. Mills are holding a wait-and-see policy, with the exception of one, which last week started combing the market for premium grades. Most mills are getting less than their daily melt, but are in fairly comfortable stock position. Rails continue in tight supply. Cast demand is almost nil.

Birmingham — Most scrap moving to the district is melting steel for which commitments already have been made. Dealers are fairly well supplied and are shipping moderate tonnages elsewhere. Cast grades remain in slow demand.

Los Angeles — Decreased interest by mills is softening the price tone in the scrap market. With more scrap produced than taken, scrap supplies are increasing.

San Francisco A scrap pileup during steel strike last year is responsible for the latest $2 a ton markdown, made effective last week, on all grades of open-hearth materials, except No. 1 heavy melting, which remains firm at the $34 ceiling. Aside from that grade, OPS regulations are passe, one dealer said, pointing out that prices are so far below ceiling it is doubtful they can regain their lost ground in the foreseeable future. Mills have an average of a three months' inventory. In the meantime, No. 1 cupola cast took another dip, moving $1 a ton lower to $40, delivered.

Seattle — The larger steel scrap buyers report conditions satisfactory. Ample supplies are coming from nearby areas to meet current consumption requirements. Shippers in more distant territory can sell in the coast market if they absorb part of the freight. Imports from British Columbia have eased the local situation. Heavy melting is generally quoted at $31, bundles at $28.50 and $29. Inventories are increasing slowly.

Iron Ore . . .

Iron Ore Prices, Page 163

Birmingham United States Steel Corp.'s Tennessee Coal and Iron Division has retired an iron ore mine.

Arthur V. Wiebel, TCI president, announced that Muscoda No. 4 mine has been closed permanently after 65 years of operation. The shutdown was necessary, Mr. Wiebel said, because the ore deposit in the mine has been virtually exhausted.

Opened in 1888, only two years after the company moved into the Birmingham district, the mine has been driven back about two miles from the entrance, and has reached a depth of 960 ft below sea level at its lowest point. The elevation at the tipple is 720 feet above sea level.

Six TCI ore mines remain in operation, located at Muscoda and Wenonah.

The closing of this mine should by no means be construed as indicating that the district's ore deposits are nearing exhaustion, Mr. Wiebel said. On the contrary local geologists have every reason to believe that there is still sufficient ore here to last far beyond the lifetime of anyone living today.

Canada . . .

Toronto, Ont. — For October production of primary iron and steel shapes in Canada was 410,405 net tons, including 396,869 tons of carbon and 13,536 tons of alloy steel shapes; September production amounted to 385,465 net tons, including 371,113 tons of carbon and 14,352 tons of alloy steel shapes. For October, 1951, production was 410,347 net tons, including 398,550 tons of carbon and 12,540 tons of alloy steel shapes. Included in production for last October were 131,551 tons delivered under producers' interchange to plants within the primary industry for further processing.

Primary iron and steel shapes shipped for sale in October amounted to 285,471 net tons and included 272,721 tons of carbon and 12,750 tons of alloy steel shapes; September shipments amounted to 242,591 net tons, including 232,501 tons of carbon and 14,090 tons of alloy steel shapes and for October, 1951, shipments were 269,539 tons including 256,999 tons of carbon and 12,540 tons of alloy steel shapes.

Shipments for sale in October included 14,707 tons of semifinished shapes; 19,603 tons of structurals; 22,382 tons of plates; 25,133 tons of rails; 11,443 tons of tie plates and track material; 45,583 tons of hot-rolled bars; 21,650 tons of pipes and tubes; 26,205 tons of wire rods; 26,809 tons of black sheets; 10,190 tons of galvanized sheets; 9344 tons of castings and 52,122 tons of other rolled products.

Of shipments for sale in October 57,308 tons went directly to railways and railway car shops; 12,814 tons to pressing, forming and stamping plants; 32,775 tons to merchant trade products; 33,816 tons to building construction; 27,218 tons to the containers industry; 12,290 tons to agricultural equipment; 21,023 tons to the automotive industry; 12,909 tons to machinery plants; 5938 tons to shipbuilding; 13,653 tons to mining, lumbering, etc., and 8943 tons to miscellaneous industries. Wholesalers and warehousing accounted for 35,296 tons and exports for 8488 tons.

STRUCTURAL SHAPES . . .

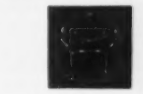
STRUCTURAL STEEL PLACED

1700 tons, pier No. 1, Boston & Albany terminal, East Boston, Mass., to West End Iron Work, Cambridge; Raymond Concrete Pile Co., Boston, general contractor.

750 tons, new building, General Electric Co., Bridgeport, Conn., to Ernst Iron Works, Buffalo.

500 tons, cold strip mill buildings, Thompson Wire Co., Sparrows Point, Md., to Bethlehem Steel Co.; Travis Construction Co., Baltimore, general contractor.

400 tons, aircraft parts building, Fenn Mfg. Co., Newington, Conn., to Bethlehem Steel Co., through F. H. McGraw & Co., Hartford, Conn., general contractor.



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View at left shows a portion of ESNA's Heat Treating Department. Self-locking nuts are conveyed through two American Gas Reciprocating Furnaces into AGF conveyorized quench tanks. Mesh conveyors carry the work into **METALWASH** hot spray washer where quenching oil is removed prior to tempering.

METALWASH machine conveys the work directly into continuous tempering unit (not visible in photo).

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325 tons, building, B. F. Sturtevant Division, Westinghouse Electric Corp., Hyde Park, Boston, to Bethlehem Steel Co.

250 tons, state bridge, Wyrk, Airport circle, Camden, N. J., through Rolyn Construction Co., Trenton, N. J., subcontractor, to Bethlehem Steel Co.

110 tons, auto maintenance shop, Ladd Field, Alaska, to Isaacson Iron Works, Seattle; Bren-Sealand Co., Seattle, general contractor.

120 tons, Church of St. Ann, Bristol, Conn., to City Iron Works, Hartford, Conn.; Wadsworth & May, general contractors.

Heddles boiler house, Pratt & Whitney, Hartford, Conn., to City Iron Works, Hartford; Bartlett & Brainerd, Hartford, general contractors.

STRUCTURAL STEEL PENDING

500 tons, west approaches, Tappan Zee bridge, Hudson river, Nyack, N. Y., American Bridge Division, United States Steel Corp., Pittsburgh, low $3,182,265.

4000 tons, approach work, Hudson river bridge, off Rockland county, New York State Thruway, American Bridge Division, United States Steel Corp., Pittsburgh, low bidder.

7500 tons H-pile, 14-BP-89 lb per section, for Hoboken piers, Port of New York Authority department of purchase, New York; bids asked.

1300 tons, state bridges, Montgomery county, New York; bids Feb. 10, Albany.

2700 tons, state bridge, New York Thruway, Ontario and Erie counties, New York; Johnson, Drake & Piper Inc., low on general contract.

1500 tons, navy repair shop, Lakehurst, N. J.; bids Feb. 26.

2850 tons, also 240 tons corrugated metal roofing, hangars, Fairchild Air Field, Washington State; bids to U. S. Engineer, Seattle, about Mar. 12.

1400 tons, Cantilever maintenance hangar, Fairchild air base; bids to U. S. Engineer, Seattle, Feb. 26.

1100 tons, preliminary estimate, bridge, Penobscot river, Bangor-Brewer, Me., also 300 tons, concrete reinforcing bars.

1000 tons, state bridge, Anne Arundel county, Maryland; bids closed.

1000 tons, wire-cable building, General Electric Co., Bridgeport, Conn.

700 tons, state bridge, Albany county, New York; bids Feb. 11, Albany.

385 tons, beams and angles, Corps of Engineers, Pittsburgh; bids in.

250 tons, airmen barracks, Ft. Dix, New Jersey; Arthur Venneri Co., East Westfield, N. J., low on general contract.

Six tons, 229-foot, three-span continuous steel girder bridge, Daniel Webster highway, Merrimack, N. H.; bids Feb. 13, Concord, also 80 tons concrete reinforcing bars and 9400 sq ft open grid steel floor.

300 tons, also 55 tons steel piling, Little Porcupine power plant, Montana; bids to Bureau of Reclamation, Fort Peck, Mar. 12.

250 tons, including gates and hoist, East Low canal, Columbia basin project; bids to Bureau of Reclamation, Ephrata, Wash., Mar. 3.

200 tons, alterations, Frankford High School, Philadelphia; bids closed.

100 tons, traffic interchange, Major Egan Expressway, Bronx, N. Y., Ruscitano & Son Corp., New York, low.

REINFORCING BARS . . .

REINFORCING BARS PLACED

100 tons, officers' quarters, Richardson Field, Alaska, to Northwest Steel Rolling Mills, Inc., Seattle.

REINFORCING BARS PENDING

2340 tons, contract 13, section 1, Garden State parkway, Essex county, New Jersey; bids Feb. 19.

2000 tons, Missouri diversion dam and Little Porcupine power plant, Missouri river; bids to Bureau of Reclamation, Fort Peck, Mont., Mar. 12.

1000 tons, three 15-foot diameter siphons and other items, East Low canal, Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash., Mar. 3.

100 tons, retaining wall and trunk sewer, Kenilworth avenue, N. E., Washington; bids Feb. 26.

280 tons, piers, Kanawha river bridge, West Virginia turnpike near Reed, W. Va.; bids Feb. 25, Charleston, W. Va.

265 tons, highway contracts 23A and 25B, West Virginia turnpike; bids Feb. 24, Charleston, W. Va.

PLATES . . .

PLATES PLACED

200 tons, including shapes, 242-foot double ended ferry, to Commercial Ship Repair Co., Seattle, by San Diego & Coronado Ferry Co., San Diego, Cal.

200 tons, elevated water tank, Bethpage, N. Y., to Chicago Bridge & Iron Co., Chicago.

130 tons, elevated steel water tank for Sumner, Wash., to Pittsburgh-Des Moines Steel Co., Seattle office, low $56,673.

PLATES PENDING

220 tons, plate, structural, Corps of Engineers, Pittsburgh; bids in.

150 tons, fuel storage tanks, Larson field, Washington state; bids in.

100 tons, fuel storage tanks, Fairchild Field, Washington state; bids to U. S. Engineer, Seattle, about Mar. 10.

100 tons, storage tanks, etc., Arco reactor station; bids to Atomic Energy Commission, Arco, Idaho, Feb. 17.

RAILS, CARS . . .

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Gulf, Mobile & Ohio, 100 fifty-ton high side gondola cars, to St. Louis plant of American Car & Foundry Co., New York.

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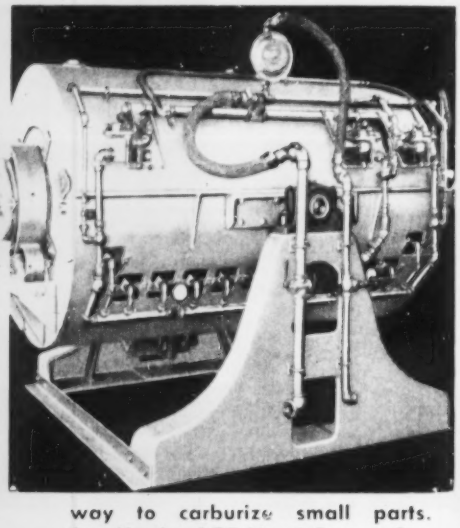

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Here and There in Metalworking . . .

CONSTRUCTION ENTERPRISE ORGANIZATIONAL CHANGES

Birmingham Committee of 100

Meryl H. Geisking, assistant to the president, Tennessee Coal & Iron Division, United States Steel Corp., is the 1953 vice chairman of the Birmingham Committee of 100. This committee has brought 56 new plants and industries to the Birmingham district in the three years since its founding in January, 1950. The committee chairman is Edward L. Norton, president, Coosa River Newsprint Co., Childersburg, Ala. Among members of the committee are: Bradford C. Colcord, president, Woodward Iron Co.; W. W. French Jr., president, Moore-Handley Hardware Co.; Claude S. Lawson, president, U. S. Pipe & Foundry Co.; A. V. Wiebel, president, Tennessee Coal & Iron Division, United States Steel Corp.

Youngstown Mfg. Expands Facilities

Youngstown Mfg. Co. Inc., Youngstown, is expanding its facilities at a cost of over $350,000. The company is installing a third aluminum extrusion press, heat treating, anodizing and other aluminum working facilities.

Illinois Tube Moves Offices

Illinois Tube Co. moved its office and mill to 3200 W. Touhy Ave., Skokie, Ill.

Bridgeport Chain Changes Name

Bridgeport Chain & Mfg. Co., Bridgeport, Conn., changed its name to Round Bridgeport Chain & Mfg. Co.

Grieve-Hendry Moves Plant

Grieve-Hendry Co. Inc., manufacturer of industrial ovens, moved to larger quarters at 1811-19 W. Lake St., Chicago.

Vanadium Corp. Appoints Agent

Vanadium Corp. of America, New York, appointed Whitehead Metal Products Co. Inc., that city, as a distributor of its products, principally to iron foundries in the northwestern United States.

Canadian Firm Expanding Facilities

By the end of this month, Standard Iron & Engineering Works Ltd., Edmonton, Alta., will have in operation the first large stress relieving furnace in the prairie provinces. The company also is installing a complete x-ray laboratory for examination of welds and will offer a complete service from design to completed article. The facilities will be available for custom work and the stress relief of fabricated piping and other weldments.

Reuland To Build Detroit Plant

Reuland Electric Co., Alhambra, Calif., manufacturer of special electric motors and magnetic brakes, will construct a factory near Detroit. Construction is scheduled to start by early spring.

Rockford Machine Tool Names Agent

Rockford Machine Tool Co., Rockford, Ill., appointed Sales & Service Machinery Co., Philadelphia, as its exclusive distributor in eastern Pennsylvania, southern New Jersey and Delaware.

Babcock & Wilcox Gets Furnace

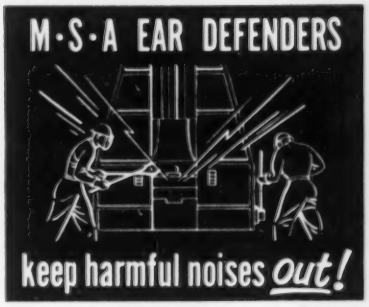
George J. Hagan Co., Pittsburgh, completed installation of a rotary hearth bloom heating furnace in the steel mill of Tubular Products Division, Babcock & Wilcox Tube Co., at Beaver Falls, Pa.

Rasch To Make Appliances

Rasch Mfg. Corp., Kansas City, Mo., acquired certain assets of Security Mfg. Division, Kemper Investment Co., and will engage in the production and sale of gas-fired appliances. William T. Rasch is president of the new corporation.

Alcoa Boosts Production

The third potline at Aluminum Co. of America's reduction plant in Wenatchee, Wash., has gone into operation. Production has risen to about 75 per cent of capacity. Power



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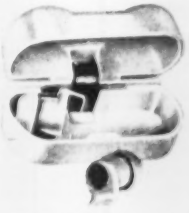

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Detroit Editor Changes

Floyd G. Lawrence, since Mar. 10, 1952, an assistant editor of STEEL, became the Detroit Editor on Feb. 1, succeeding Howard Tuttle who resigned to accept a position with the public relations department at Ford Motor Co. Mr. Lawrence, who is a sport car enthusiast, has worked for the *Cleveland Press*, Harsch Bronze Foundry, and Mix Mfg. Co., Cleveland.

is being received from the fourth generator at the Rock Island plant as well as some interruptible power from Bonneville.

Utica Structural Steel Expands

Utica Structural Steel Co. is constructing an assembly plant and warehouse in Utica, N. Y. The structure will be completed about Feb. 20 and will be four times larger than the one razed by fire in October.

Channing Buys Equipment Store Firm

Channing Corp., San Francisco, purchased the assets of Hockaday & Phillips Inc., automotive parts and equipment store firm. Six stores of the firm are being operated by Channing's Chanslor & Lyons Co. under the Hockaday & Phillips name.

Reynolds Appoints Distributor

Reynolds Metals Co., Louisville, appointed Aluminum Distributors Inc., Chicago, as its representative in that territory.

Wilcox-Gay Moves Headquarters

Wilcox-Gay Corp. and its Majestic Radio & Television Division are occupying new executive, sales and advertising offices at 79 Washington St., Brooklyn, N. Y. Part of the building at that address is devoted to production and warehousing. Purchasing, production, engineering and government division contracts are retained at the main Brooklyn plant, 70 Washington St.

Hoffman Retooling Scranton Plant

U.S. Hoffman Machinery Co., which leased the locomotive shops of the Delaware, Lackawanna & Western Railroad in Scranton, Pa., plans to start production in the new location by mid-summer. The shops will be thoroughly refitted by the Hoffman concern.

Harris Changes Corporate Name

Harry Harris & Co., Kearny, N. J., operator of a cold reduction mill, changed its name to Harris Steel Co. Jerome E. Harris, formerly executive vice president, was named president; Harry Harris, formerly president, chairman of the board of directors.

Allis-Chalmers Names Agents

Allis-Chalmers Mfg. Co., Milwaukee, appointed William C. Henderson as its sales representative in its Los Angeles district office. The company also appointed Valley Equipment & Supply, Burbank, Calif., as a distributor for its motors, controls, transformers and drive equipment in that area.

Plastic Wire & Cable Expands

Plastic Wire & Cable Co., Jewett City, Conn., is building a plant for expansion of its production facilities.

Longley Forms Pump & Filter Unit

Truman E. Longley Co., Cleveland, organized a Pump & Filter Division. Under direction of Denny White and his assistant, Gene Brill, this division will handle sales and service of supplies applicable to plant engineering and equipment maintenance.

Norge To Make Hamilton Washers

Norge Division, Borg - Warner Corp., Chicago, will manufacture at its Herrin, Ill., plant the automatic washer to be marketed by Hamilton Mfg. Co., Two Rivers, Wis.

Little To Enlarge Facilities

New research facilities for Arthur D. Little Inc., Cambridge, Mass., will be erected on the Concord turnpike in West Cambridge. Construction will begin in April. The firm is engaged in industrial research and engineering.

Rust Designing Zirconium Plant

Carborundum Metals Co. Inc., Pittsburgh, will build a $2.5 million plant at Akron, N. Y., to produce zirconium and hafnium metals. The plant, the first to produce these metals in a commercial operation, is being designed by Rust Process Design Co., Pittsburgh. Carborundum signed a five-year contract with the Atomic Energy Commission, Washington, for delivery of 150,000 lbs of zirconium and hafnium sponge metals from the facility each year.

Die Supply Corp. Organized

Die Supply Corp. was organized and established headquarters at 234 Carolina St., Buffalo. The firm will handle die sets, components and tool, die and machine shop accessories. D. F. Hawkins is sales manager; J. M. Kraus, office manager.

Hall To Build in Wilmington

L. Norris Hall Inc., Philadelphia, awarded a contract to Luria Engineering Co., Bethlehem, Pa., for construction of a steel warehouse at Christiana and A streets, Wilmington, Del. The warehouse will carry carbon steel bars, plates, shapes and sheet. Wallace D. Hall is president.

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PLANT MANAGER. 15 years' experience in Plant Management, Production Control, Accounting Problems, Manufacturing Development, etc. Small manufacturing plant preferred. Could invest. Age 45, married, family. Write Box 630, STEEL, Penton Bldg., Cleveland 13, Ohio.

REGISTERED PROFESSIONAL ENGINEER. 15 years diversified electrical and mechanical development experience. Now employed as plant superintendent by company engaged in general machinery repair, motor repair, and manufacturing. Desires responsible supervisory position requiring above average ability. Small town not objectionable. Write Box 637, STEEL, Penton Bldg., Cleveland 13, Ohio.

BASIC STEEL PLANT MANAGER. 40 years old, successfully experienced in works management. Have directed and coordinated staff services for safe, profitable operations. Prior experience as superintendent in steel producing and flat rolling departments. Write Box 659, STEEL, Penton Bldg., Cleveland 13, Ohio.

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STEEL SALESMAN: BAR MILL PRODUCTS. Territory Atlantic seaboard principally southeastern States. Salary and expenses with added incentive compensation. Reply complete resume stating salary expected. Write Box 643, STEEL, Penton Bldg., Cleveland 13, Ohio.

METALLURGIST. Sales experience familiar with stainless steel pipe and tubing; thorough knowledge of process piping system in chemical plants, required by large Eastern Distributor. Some traveling necessary in Eastern States. Write stating age, qualifications, salary, etc. Reply Box 656 STEEL, Penton Bldg., Cleveland 13, Ohio.

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Preferably with Tool & Die Experience but must be strong on supervisory qualifications. Midwest metal fabricating concern will offer excellent opportunity to qualified men. Give full details of experience, age and salary expectations in first reply. Reply Box 660, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Experienced in all phases of metal fabrication, such as deep drawing, forming, progressive die work and eyelet production. Midwest location. Many employment benefits. Reply Box 661, STEEL, Penton Bldg., Cleveland 13, Ohio.

EXPERIENCED STRUCTURAL STEEL LAYout man and fitter for established plant on the Eastern Shore of Maryland. State experience, present duties and compensation. Replies held strictly confidential. Write Box 662, STEEL, Penton Bldg., Cleveland 13, Ohio.

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STEEL SHEET PRODUCTS

Its modern equipment of shears, presses, welding machines, etc., is adapted to all sheet and platework up to ¼ inch thick. Excellent selling organization covering Western Europe.

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New, rapidly expanding steel mill now in operation ready to fill position of Rolling Mill Superintendent. Electric furnace, thirty ton capacity, producing carbon and alloy grades. 18" and 10" rolling mills (9 stands designed for further expansion). Require top grade full operational experience in rolling and conditioning all grades. Must know equipment, roll design and roll shop. Salary with production incentive open, consistent with experience and ability. This is top position with exceptional future. Age limit 50 years. Answer with full details of experience and references. Include personal photograph.

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SEIDELHUBER STEEL ROLLING MILL CORP.
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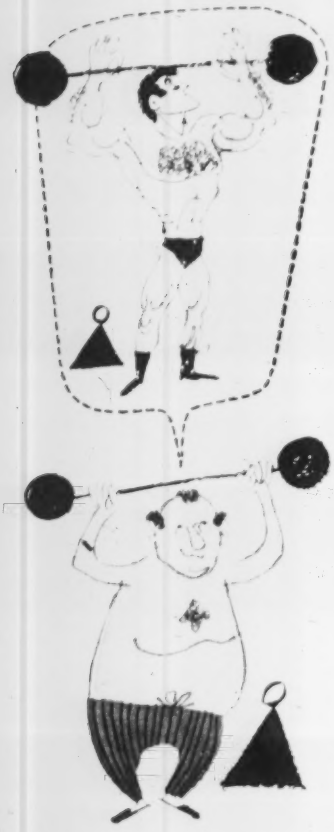
Seattle 6, Washington



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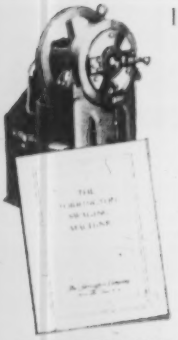
Torrington Swaging Machines taper both tubular and solid work quickly, accurately and economically. Delivering 4000 hammer blows a minute, the swager gives the metal toughness and resiliency . . . utilizes all the stock.



Our booklet, "The Torrington Swaging Machine," describes the art of swaging and illustrates the complete line of Torrington Swagers. Write for your free copy . . . today!

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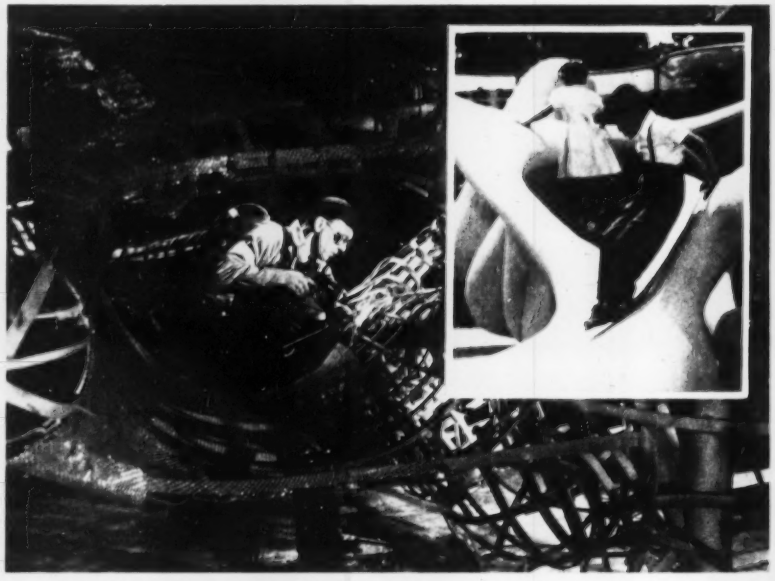

From Shipbuilding to Sculpturing

From wartime shipbuilding to playground sculpturing, the stud welding gun, invented during World War II by a Mare Island, Calif., shipyard welder, saves time and money. The play sculpture, insert, was built for the city of Oakland, Calif., by Macri & Hood Iron Works. Use of the gun to install the wire mesh over which plaster was shaped saved the company 30 to 40 per cent of the labor which would have been required by other methods. The unit is 30 feet long.

Rec Activates Engine Division

Reo Motors Inc., Lansing, Mich., activated its Industrial & Marine Engine Division. Sales activities and engineering developments of this division are headed by R. D. Jacobs II.

Electric Boat Co. Expanding

Electric Boat Division, General Dynamics Corp., Groton, Conn., will erect a building to house its expanding design department. The structure will include 35,000 sq ft of additional floor space and vaults for storing valuable designs.

Twin Coach To Buy Machinery

Twin Coach Corp., Buffalo, will begin full-scale production soon on a new multi-million dollar order for Grumann Aircraft. The plant will install about $1 million worth of new machinery in 1953. Some defense orders run through the first half of 1955.

Tubing Maker Appoints Agent

Pennsylvania Flexible Metallic Tubing Co., Philadelphia, appointed Murray - Baker - Frederic Inc., New Orleans, as its distributor in that territory.

Englander Producing Shells

Englander Co., Chicago, whose sleep equipment plant was one of the first obtained for Birmingham by the Committee of 100, is producing 155 mm shells for the Ordnance Department. The company also maintains a mattress warehousing facility in the city.

Fruehauf Builds Branch Factory

Fruehauf Trailer Co., Detroit, is constructing a branch factory one mile south of Jacksonville, Fla. It will replace the former factory at 1190 King's Rd., that city.

Homestrand Appoints Distributor

Homestrand Inc., Larchmont, N. Y., distributor of Swedish measuring tools and instruments, appointed Clair L. Martin Co., Indianapolis, as its representative in that territory.

Merritt-Chapman Moves Offices

Merritt-Chapman & Scott Corp., engineering contractor, moved its offices to 260 Madison Ave., New York.

Tapco Moves Purchasing Offices

Purchasing offices of Tapco divisions, Thompson Products Inc., moved to 1341 E. 222nd St., Cleveland. The mailing address continues to be 23555 Euclid Ave., Cleveland 17.

Aeroquip Licenses British Firm

Aeroquip Corp., manufacturer of hose, fittings, and flexible hose assemblies, licensed the production and sale of its products in Great Britain, Australia, New Zealand, and South Africa by Super Oil Seals & Gaskets, Birmingham, England.

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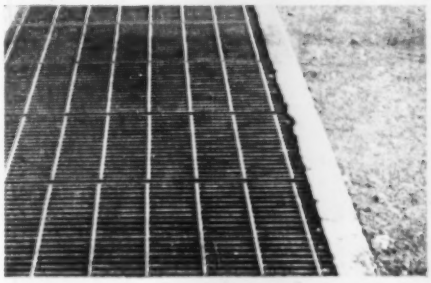
Hendrick Heavy-Duty Grating . . .



has wide range of usefulness

withstands weight of heaviest trucking, inside or outside of industrial plants . . . excellent for drainage applications . . . for coal grizzlies . . . and wherever it is necessary to sustain unusually heavy loading.

In prominent steel casting plant, Hendrick heavy-duty grating used for breakout floors has paid for itself many times over in reclaimed sand.

Bearing bars range in size from $2\frac{1}{4}$" x $\frac{3}{8}$" to 4" x $\frac{1}{2}$", cross bars from 2" x $\frac{3}{16}$" to $2\frac{1}{4}$" x $\frac{5}{16}$": to meet requirements of loading conditions. Write for complete specifications.

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Sales Offices In Principal Cities

Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
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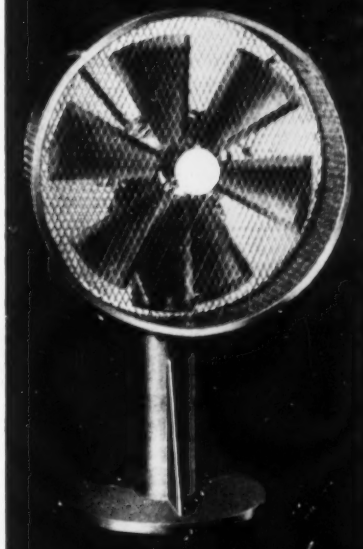
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids



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B. F. Perkins & Son, Inc.
HOLYOKE, MASSACHUSETTS
Manufacturers of Industrial Machinery Since 1873

PERKINS MAN COOLERS

TRADE MARK REGISTERED UNITED STATES PATENT OFFICE

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Faster assembly . . . no more failures of fasteners. GREER STOP NUTS hold firm against jolts, shocks, shimmy, wobbles . . . any vibration, any kind.

Bolt threads are gripped tightly . . . these famous nuts *never* work loose. Yet an ordinary hand wrench gives instant release. The tough, built-in GREERCOID collar does it . . . and seals against fluid leakage, too!

Study *your* fastener problem. Over 3000 types and sizes. Consult GREER. Proved on thousands of products. Meets gov't and military specifications.

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GREER STOP NUT CO.
2620 Flournoy, Chicago 12, Ill.

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Stop Nuts

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Farval Announces DC 20 Automatic Pumping Unit

for complete lubrication of smaller machines

NOW any small machine can have a completely automatic system of Farval centralized lubrication—as efficient and economical as the larger systems which have proved so valuable on heavy industrial equipment during the past 26 years.

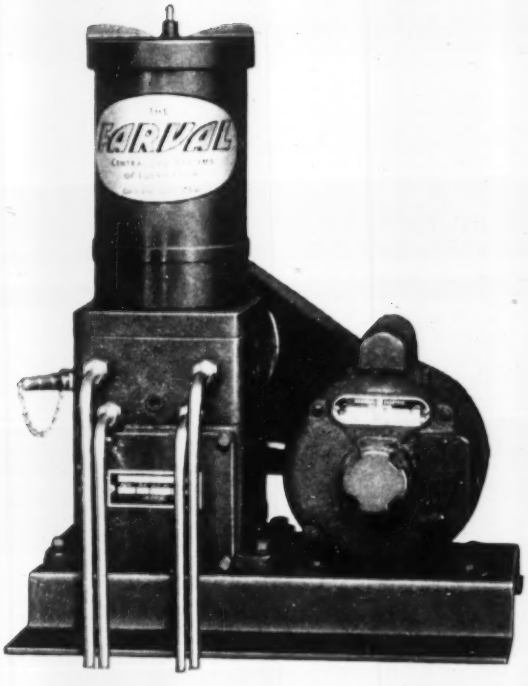
Chief component of this smaller, low cost system is the new Farval DC20 pumping unit which handles either grease or oil. In addition to the pumping unit, the complete Farval system consists of two main supply lines, the familiar Dualine measuring valves and discharge line connections from measuring valves to the bearings.

Easily installed at any convenient place on or near a machine, the DC20 insures automatic delivery of lubricant to bearings, as often as needed, in whatever quantities desired, while the machine is in operation. Remember that Farval—and Farval only—employs the Dualine valve that is fully adjustable—simple, sure and foolproof—with a positive indicator which visually signals that the valve has functioned.

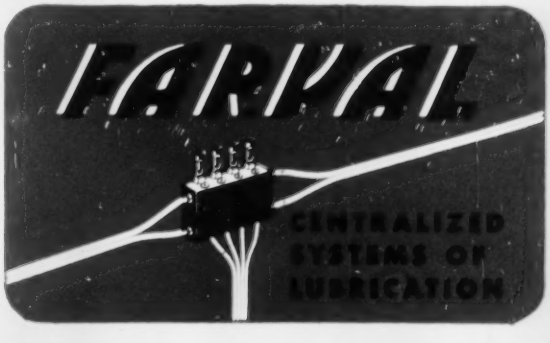
Hundreds of operators using the larger Farval automatic systems have discovered that the entire cost of a system is saved the first year. Lubricant savings alone may run as high as 75%.

Investigate the new DC20. Near you is an experienced Farval lubrication engineer who will demonstrate how the new DC20 pumping unit can save time and money and increase production on your present hand-lubricated machines. Write today for a copy of Bulletin 39, "DC20 Pumping Unit for Smaller Machines". The Farval Corporation, 5270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

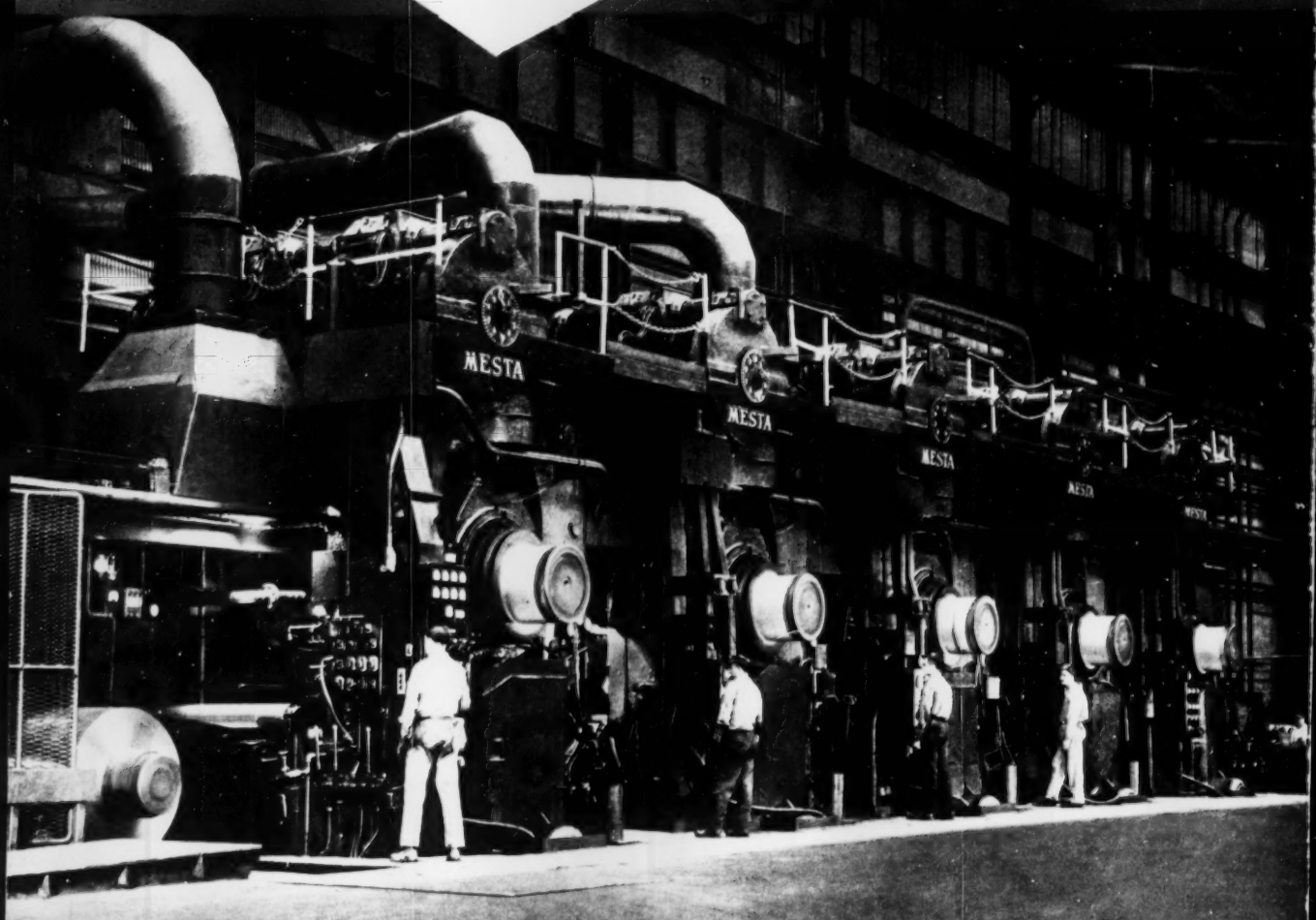


ALL PARTS OF THIS NEW FARVAL DC20 *automatic pumping unit are assembled on a single base plate ready for quick, easy mounting at any convenient point. Supply lines run from the pumping station to the Dualine measuring valve manifolds, one valve for each bearing to be lubricated. The entire system is installed very simply and at a cost that will be repaid in a few months in savings effected.*



MESTA

HIGH-SPEED COLD MILLS



SIMULTANEOUSLY MACHINING ROLLING MILL HOUSINGS IN PAIRS ON MESTA HEAVY DUTY DRAW-CUT SHAPERS

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA